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## CONTRACT DOCUMENTS

June 2018

TOWN OF

**Arlington**

MASSACHUSETTS

Phase #10 Sanitary Sewer Rehabilitations

Bid Invitation No. 18-32

MWRA I/I Local Financial Assistance

Program Project No. #WRA-P9-01-3-984



  
6/27/18

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SECTION 00100

ADVERTISEMENT FOR BIDS

**BID INVITATION No. 18-32 PHASE #10 SANITARY SEWER REHABILITATIONS**

Town of Arlington, Massachusetts

Sealed bids for construction of Phase #10 Sanitary Sewer Rehabilitations for the Town of Arlington, Massachusetts, will be received at the Purchasing Department, 730 Massachusetts Avenue, Arlington, MA 02476 until **10:00 AM prevailing time, on July 19, 2018** at which time and place said bids will be publicly opened and read aloud.

All bids must be in a sealed envelope plainly marked: **BID INVITATION No. 18-32 PHASE #10 SANITARY SEWER REHABILITATIONS**

The scope of work of the Base Bid includes approximately: 60 linear feet of pipe bursting (two (2) parallel 8-inch cast iron siphon barrels approximately 30 linear feet); installation of approximately 134 linear feet of HDPE siphon pipe; replacement of 40 linear feet of 6-inch gravity sewer pipe; replacement of two (2) sewer siphon structures; set-up of a temporary sewer bypass system for the siphon replacement; and other related tasks in the Town of Arlington, Massachusetts.

The scope of work of the Alternate Bid No. 1 includes approximately: 26 linear feet of open cut point repairs of sanitary sewers at two (2) locations; replacement of 15 linear feet of building connections at one (1) location; installation of four (4) precast concrete sewer manholes; 924 linear feet of root treatment; 4,944 linear feet of cured-in-place pipe; grouting 101 service connections in cured-in-place pipe; cutting of six (6) protruding service connections; exterior grouting and interior sealing of 253 vertical feet of sewer manholes; grout and patch three (3) sewer manholes; install seven (7) manhole inflow dishes; replacement of one (1) manhole frame and cover; 1,000 linear feet of cleaning and inspection of sewers; 4,944 linear feet of post-construction flow isolation; and other related tasks in the Town of Arlington, Massachusetts.

The scope of work for Alternate Bid No. 2 includes approximately: 1,075 linear feet of 18-inch cured-in-place pipe; grouting five (5) service connections in cured-in-place pipe; inspecting, testing, and sealing of six (6) service connections, exterior grouting and interior sealing of 24 vertical feet of sewer manholes; raising one (1) manhole frame and cover to grade; 1,330 linear feet of post-construction flow isolation; and other related tasks in the Town of Arlington, Massachusetts.

The scope of work for Alternate Bid No. 3 includes approximately: 262 linear feet of root treatment; 1,341 linear feet of cured-in-place pipe; grouting 29 service connections in cured-in-place pipe; 262 linear feet of structural cured-in-place pipe; grouting seven (7) service connections in structural cured-in-place pipe; exterior grouting and interior sealing of 77 vertical feet of sewer manholes; grout and patch three (3) sewer manholes; raising three (3) manhole frame and cover to grade; 1,603 linear feet of post-construction flow isolation; and other related tasks in the Town of Arlington, Massachusetts.

The scope of work for Alternate Bid No. 4 includes approximately: 803 linear feet of root treatment; 900 linear feet of cured-in-place pipe; grouting 13 service connections in cured-in-place pipe; cutting of one (1) protruding service connections; exterior grouting and interior sealing of 35 vertical feet of sewer manholes; building a bench and invert in three (3) sewer manholes; 900 linear feet of post-construction flow isolation; and other related tasks in the Town of Arlington, Massachusetts.

The contract duration for the Base Bid is 30 consecutive days, or if selected, the contract duration for the Base Bid and Alternate No. 1 is 100 consecutive days, or if selected the contract duration for the Base Bid and Alternate No. 1 and No. 2 is 115 consecutive days or if selected the contract duration for the Base Bid and Alternate No. 1 and No. 2 and No. 3 is 135 consecutive days or if selected the contract duration for the Base Bid and Alternate No. 1 and No. 2 and No. 3 and No. 4 is 145 consecutive days. Warranty inspections for all bids shall be complete within 35 consecutive days from the start of warranty inspections. Final paving related to rehabilitations shall be completed prior to May 15, 2019.

**Bid Security in the form of a bid bond, cash, certified check, treasurer's or cashier's check payable to the Owner, is required in the amount of five percent of the bid, in accordance with Section 00200, INSTRUCTIONS TO BIDDERS.**

The Instructions to Bidders, Form of General Bid, Agreement, Plans, Specifications, Performance and Payment Bond, and other Contract Documents may be examined at the following:

Weston & Sampson Engineers, Inc., Peabody, Massachusetts

Accent Printing, Inc., 99 Chelmsford Road, North Billerica, Massachusetts

Contract Documents may be viewed and downloaded as a Portable Document Format (PDF) file free of charge at [www.accentblueprints.com](http://www.accentblueprints.com). Copies may be obtained for a fee by completing an order online or by calling 978-362-8038 for each set. Completed orders may be picked up at the office of Accent Printing located at 99 Chelmsford Road, North Billerica, MA 01862 (978-362-8038), from 9 a.m. to 4 p.m. Copies may also be shipped to prospective bidders for an additional charge to cover handling and mailing fees. All payments for printing and shipping are nonrefundable. For addition to the project plan holder's list to guarantee receipt of addenda, it is recommended interested bidders obtain the Contract Documents directly from Accent. Interested bidders will be prompted to register an email address with Accent to access the documents.

The selected contractor shall furnish a performance bond and a payment bond in amount at least equal to one hundred percent (100%) of the contract price as stipulated in Section 00700 GENERAL CONDITIONS of these specifications.

Minority-owned Business Enterprise (MBE), Women-owned Business Enterprise (WBE) and Equal Employment Opportunity policies of the Massachusetts Water Resources Authority (MWRA) are applicable to this Contract. The Contractor shall comply with all applicable laws and regulations pertaining to nondiscrimination, equal opportunity and affirmative action, including without limitation executive orders and rules and regulations of federal and state agencies of

competent jurisdiction. The Contractor shall make positive efforts to achieve: (1) a minority employee work force goal of 15.3 percent, (2) a woman employee work force goal of 6.90 percent, (3) a goal of 7.24 percent participation of Minority-owned Business Enterprise(s), and (4) a goal of 3.60 percent participation of Woman-owned Business Enterprise(s) within project contracts. At a minimum, the Contractor should allow MBEs and WBEs the maximum feasible opportunity to compete for subagreements to be performed under the project.

All bids for this project are subject to applicable bidding laws of Massachusetts, including General Laws Chapter 30, Section 39M as amended.

Prevailing Wage Rates as determined by the Director of the Executive Office of Labor and Workforce Development under the provisions of the Massachusetts General Laws Chapter 149, Section 26 to 27H, as amended, apply to this project. It is the responsibility of the Bidder, before bid opening, to request if necessary, any additional information on Prevailing Wage Rates for those trades people who may be employed for the proposed work under this contract.

By submission of a bid, the Bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 days, Saturdays, Sundays and legal holidays excluded after the opening of bids.

The Owner reserves the right to waive any informalities in bids and to reject any or all bids.

TOWN OF ARLINGTON, MASSACHUSETTS

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Adam W. Chapdelaine  
Town Manager

Weston & Sampson Engineers, Inc.  
Peabody, Massachusetts

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## SECTION 00200

### INSTRUCTIONS TO BIDDERS

1. Receipt and Opening of Bids
2. Location and Work to be Done
3. Preparation of Bid
4. Modification of Bids
5. Obligation of Bidder
6. Information not Guaranteed
7. Bid Security
8. Time for Completion
9. Addenda and Interpretations
10. Bid Opening Procedure
11. Comparison of Bids
12. Statutes Regulating Competitive Bidding
13. Right to Reject Bid
14. Ability and Experience of Bidder
15. Conditions of Work
16. Security for Faithful Performance
17. Power of Attorney
18. Laws and Regulations
19. Liquidated Damages for Failure to Enter into Contract
20. Indeterminate Items and Estimated Quantities
21. CONTRACTOR Records
22. Bidder Certification – OSHA Training
23. Prevailing Wage Rates
24. Price Adjustments
25. Minority and Women Business Enterprise Requirements

1. Receipt and Opening of Bids

The Town of Arlington, Massachusetts, herein called the OWNER, acting by and through its Purchasing Department will receive sealed Bids for the construction of Phase #10 Sanitary Sewer Rehabilitations.

Such bids addressed to the Purchasing Department and endorsed Bid will be received at the Purchasing Department, 730 Massachusetts Avenue, Arlington, MA 02476 until **10:00 AM prevailing time, on July 19, 2018** at which time and place said bids will be publicly opened and read aloud.

If the building at which bids are to be received is closed for any reason on the date and time that bids are due, receipt of bids by the Owner will be postponed until the next business day at the time originally stated for receipt of bids.

Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified will not be considered. By submission of a bid, the bidder agrees that this bid shall be good and may not be withdrawn for the number of days, after the opening of bids, as stipulated in the FORM OF GENERAL BID.

2. Location and Work to be Done

The location, general characteristics, and principal details of the Work are indicated on a set of drawings titled "Phase #10 Sanitary Sewer Rehabilitations," and numbered G-1, D-1 to D-4, and C-1 to C-8, inclusive.

Additional drawings showing details in accordance with which the Work is to be done may be furnished by addendum from time to time during the bidding period by the ENGINEER and shall then become a part of the Contract Documents.

The CONTRACTOR shall furnish all superintendence, labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies, bailing, shoring, removal, and all other things necessary to do all work required for the completion of each item of the Work and as herein specified.

The Work to be done and paid for under any item shall not be limited to the exact extent mentioned or described but shall include all incidental work necessary or customarily done for the completion of that item.

3. Preparation of Bid

Each bid must be submitted on the prescribed form in Section 00410, FORM OF GENERAL BID. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, its address, and endorsed with the name of the project as specified in Receipt and Opening of Bids, above.

If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in Receipt and Opening of Bids, above.

4. Modification of Bids

Any bidder may modify its bid by written communication at any time prior to the scheduled closing time for receipt of bids. Any telegraphic communication must be received by the OWNER prior to the closing time, and, provided further, for any telegraphic communication that modifies a bid the OWNER is satisfied that a written confirmation of the modification over the signature of the bidder was mailed prior to the closing time.

The modification communication shall not reveal the bid price but shall provide the addition or subtraction or other modification so that the final prices or terms will not be known by the OWNER until the sealed bid is opened. If written confirmation is not received within two days from the closing time, no consideration will be given to the facsimile transmission.

5. Obligation of Bidder

At the time of the opening of bids each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Contract Documents (including all addenda). The failure or omission of any bidder to examine any form, instrument, or document shall in no way relieve any bidder from any obligation in respect of its bid.

6. Information not Guaranteed

All information given in the Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures is from the best sources at present available to the OWNER. All such information is furnished only for the information and convenience of bidders and is not guaranteed.

It is agreed and understood that the OWNER does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes, or other structures encountered during construction will be the same as those indicated in the Contract Documents.

It is further agreed and understood that no bidder or CONTRACTOR shall use or be entitled to use any of the information made available to it or obtained in any examination made by it in any manner as a basis of or grounds for any claim or demand against the OWNER or the ENGINEER, arising from or by reason of any variance which may exist between the information made available and the actual subsurface or other conditions, natural phenomena, existing pipes or other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

7. Bid Security

Each bid must be accompanied by a certified check, a bid bond, cash, a treasurer's or cashier's check, payable to the OWNER, in the amount stated in Section 00100, ADVERTISEMENT FOR BIDS. Such deposits will be returned to all except the three lowest responsible and eligible bidders within five days, Saturdays, Sundays, and legal holidays excluded, after the opening of bids, and the remaining deposits will be returned promptly after the OWNER and the accepted bidder have executed the Contract, or if no notice of intent to award has been presented to any bidder within 30 days, Saturdays, Sundays and legal holidays excluded, after the date of the opening of bids, upon demand of the bidder at any time thereafter.

8. Time for Completion

The successful general bidder must agree to commence work on or before a date to be specified in the written "Notice to Proceed" from the OWNER and to fully complete the project within the time limit stated in Section 00410, FORM OF GENERAL BID.

9. Addenda and Interpretations

No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally, and if provided orally, shall not be relied upon by bidders unless confirmed in a written addendum. All information given to bidders other than by means of the plans, specifications, or by addenda, as described below, is given informally and shall not be used as the basis of a claim against the OWNER or the ENGINEER.

Every request for such interpretation should be in writing (typed, not handwritten) addressed to Weston & Sampson Engineers, Inc., 5 Centennial Drive, Peabody, Massachusetts 01960 Attention: CSD, or sent via FAX to Weston & Sampson at (978) 977-0100 and to be given consideration must be received at least ten working days prior to the date fixed for the opening of bids.

Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, when issued, may be viewed and downloaded as a Portable Document File (PDF) at [www.accentblueprints.com](http://www.accentblueprints.com). A notification of addenda will be emailed to all prospective bidders to email addresses furnished by them for such purposes. Bidders picking up sets of bid documents will be given all addenda issued to date and will be required to sign for all documents, acknowledging receipt. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under its bid as submitted, and each bidder must confirm for itself that it has received all addenda. All addenda so issued shall become part of the Contract Documents.

10. Bid Opening Procedure

The following list of requirements shall be met by each filed bid.

Bids shall be filed at the place and before the time specified in Receipt and Opening of Bids, above.

The bid and all accompanying documents so required shall be signed by the Bidder or its authorized representative before submission.

All bidders shall include with their bids written acknowledgment of receipt of all addenda. Refer to acknowledgment form provided in Section 00410, FORM OF GENERAL BID.

The total dollar amount of each bid will be read, and the three apparent lowest bids will be selected for further consideration. These three apparent low bids will be read aloud for the benefit of the other bidders and the bid opening procedure will be closed. All those present



at the bid opening may examine all bids after the bid opening and after the reading of the three apparent low bids.

11. Comparison of Bids

Bids will be compared on the basis of the quantities and unit and lump sum prices stated in the bid forms.

In the event that there is a discrepancy in Section 00410, FORM OF GENERAL BID between the lump sum or unit prices written in words and figures, the prices written in words will govern.

The OWNER agrees to examine and consider each FORM OF GENERAL BID submitted in accordance with the terms and conditions set forth herein and as set forth in Section 00410, FORM OF GENERAL BID.

12. Statutes Regulating Competitive Bidding

Any bid, which does not comply with the provisions of Massachusetts General Laws Chapter 30, Section 39M as amended, need not be accepted and the OWNER may reject every such bid.

13. Right to Reject Bid

The OWNER may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids, should the OWNER deem it to be in the public interest to do so.

The OWNER may also reject bids which in its sole judgment are either incomplete, conditional, obscure or not responsive or which contain additions not called for, erasures not properly initialed, alterations, or similar irregularities, and may reject bids for any other reason permitted by law, or the OWNER may waive such omissions, conditions or irregularities.

14. Ability and Experience of Bidder

No award will be made to any bidder who cannot satisfy the OWNER that it has sufficient ability and experience in this class of work and sufficient capital and plant to enable it to prosecute and complete the work successfully within the time named. The OWNER's decision or judgment on these matters will be final, conclusive, and binding to the fullest extent permitted by law.

The OWNER may make such investigations as it deems necessary, and the bidder shall furnish to the OWNER, under oath if so required, all such information and data for this purpose as the OWNER may request.

15. Conditions of Work

Each bidder must inform itself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of its obligation to furnish all material and labor necessary to carry out the provisions of its contract. Insofar as possible the CONTRACTOR, in carrying out its work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

16. Security for Faithful Performance

Simultaneously with its delivery of the executed Contract, the CONTRACTOR shall furnish a surety bond or bonds as security for faithful performance of this Contract and for the payment of all persons performing labor and materials under this Contract as specified in Section 00700, GENERAL CONDITIONS included herein, each in the amount of 100 percent of its bid. The surety on such bond or bonds shall be a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the OWNER. The bonds shall remain in force for one year after final acceptance of the work by the OWNER, unless the OWNER, in writing, releases the CONTRACTOR from the obligation sooner.

17. Power of Attorney

Attorneys-in-fact who sign Contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

18. Laws and Regulations

Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract and any provision in violation of the foregoing shall be deemed null, void and of no effect. Where a conflict between Federal and State Laws and Regulations exists, the more stringent requirement shall apply.

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances or bylaws, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.

Attention is directed to Section 00830, STATE STATUTES AND REGULATIONS and to other applicable sections of this specification. In the event of any conflict between provisions of law or regulation quoted or paraphrased in the Contract Documents, the actual provisions of law or regulation shall control.

19. Liquidated Damages for Failure to Enter into Contract

The successful bidder, upon its failure or refusal to execute and deliver the Contract, Bonds and Certificates of Insurance required within 10 days after receipt of notice of the acceptance of the bid, shall, except as otherwise provided by applicable law, forfeit to the OWNER, as liquidated damages for such failure or refusal, the security deposited with its bid, provided that the amount forfeited shall not exceed the difference between its bid price and the bid price of the next lowest responsible and eligible bidder. In case of death, disability, bonafide clerical or mechanical error of a substantial nature, or other similar unforeseen circumstances affecting the bidder, its bid deposit will be returned.

20. Indeterminate Items and Estimated Quantities

The work to be done under this Contract has been divided into parts or items, if applicable, to enable each bidder to bid on different portions of the work in accordance with its estimate of their cost and so that the actual quantity of work executed under each item may be paid for at the price bid for that particular item, even though each bidder may have judged that such quantity may be greater or less than the estimated quantity stated in Section 00410, FORM OF GENERAL BID.

21. CONTRACTOR Records

The CONTRACTOR shall comply with the provisions of Massachusetts General Laws, Chapter 30, Section 39R, concerning CONTRACTOR records. This section has been reprinted in Section 00830, STATE STATUTES AND REGULATIONS.

22. Bidder Certification – OSHA Training

All employees who work on Massachusetts public works construction sites, on projects estimated to cost more than \$10,000, must have no less than ten (10) hours of OSHA-approved safety and health training.

The Massachusetts Attorney General is authorized to restrain award of construction contracts to any contractor who is in violation of this requirement and to restrain the performance of these contracts by non-complying contractors.

Noncompliance with this law will disqualify contractors from bidding on public contracts.

23. Prevailing Wage Rates

It is the responsibility of the bidder, before bid opening, to request if necessary, any additional information on Prevailing Wage Rates for those trades people who may be employed for the proposed work under this contract.

24. Price Adjustments

This Contract is subject to the provisions for material price adjustments in accordance with Chapter 30, Section 38A of the Massachusetts General Laws.

25. Minority and Women Business Enterprise Requirements

Minority-owned Business Enterprise (MBE), Women-owned Business Enterprise (WBE) and Equal Employment Opportunity polices of the Massachusetts Water Resources Authority (MWRA) are applicable to this Contract. The Contractor shall comply with all applicable laws and regulations pertaining to nondiscrimination, equal opportunity and affirmative action, including without limitation executive orders and rules and regulations of federal and state agencies of competent jurisdiction. The Contractor shall make positive efforts to achieve: (1) a minority employee work force goal of 15.3 percent, (2) a woman employee work force goal of 6.90 percent, (3) a goal of 7.24 percent participation of Minority-owned Business Enterprise(s), and (4) a goal of 3.60 percent participation of Woman-owned Business Enterprise(s) within project contracts. At a minimum, the Contractor should allow MBEs and WBEs the maximum feasible opportunity to compete for subagreements to be performed under the project.

END OF SECTION

## SECTION 00331

### TELEVISION INSPECTION REPORTS AND MANHOLE INSPECTION REPORTS PROVIDED BY THE OWNER

#### PART I - GENERAL

##### 1.01 PURPOSE:

###### A. PURPOSE OF LOGS, REPORTS AND FIELD OBSERVATIONS:

1. The purpose of the Television (TV) Inspection and Manhole Inspection Reports was to determine the condition of the existing sewer system and assess the extent of cleaning, repairs and/or replacement required for the system.
2. The inspections provided information to prepare the design specifications included in these contract documents and to meet the requirements of the Owner.
3. Information reported from the TV Inspection and Manhole Inspection Reports are those observed in the field at the particular location and time the observations were made, and do not necessarily represent the present conditions.

##### 1.02 SCOPE:

###### A. TV INSPECTION REPORTS:

1. TV Inspection of existing pipelines has been performed, with reasonable care. The results of the inspection program are appended hereto and are a part of the Contract Documents. Videos of what was encountered at the time of the inspection may be seen by appointment, upon request, or during the bidding period at the office of Weston & Sampson Engineers, Inc., 5 Centennial Drive, Peabody, Massachusetts. Contractors may, after obtaining Owner's permission, carry out additional pipeline inspection, at no expense to the Owner.
2. TV Inspection Reports provided in the Contract Documents are limited by the methods used for obtaining and expressing such data, and is subject to various interpretations. The terms used to describe conditions encountered are subject to local usage and individual interpretation.
3. TV Inspections have been taken substantially at the locations indicated on the drawings and shown on the logs. Information presented in the inspection logs, as to the pipe condition, material build up in the pipe; etc. is based on visual observation from the videos. Information reported on the TV Inspection logs are those observed in the field at the particular location and at the time the videos were taken, and do not necessarily represent the present conditions. Condition of the pipeline, material build up in the pipe, and other factors may differ now from those originally observed. Contractors should be aware that present conditions might affect methods of construction.

## B. MANHOLE INSPECTION REPORTS:

1. Manhole Inspections of existing manhole structures have been performed, with reasonable care. The results of the inspection programs are appended hereto and are a part of the Contract Documents. Photos of what was encountered in the manholes at the time of the inspection may be seen upon request during the bidding period at the office of Weston & Sampson Engineers, Inc., 5 Centennial Drive, Peabody, Massachusetts. Contractors may, after obtaining Owner's permission, carry out additional manhole inspections at no expense to the Owner.
2. Manhole Inspection Reports provided in the Contract Documents are limited by the methods used for obtaining and expressing such data, and is subject to various interpretations. The terms used to describe conditions encountered are subject to local usage and individual interpretation.
3. Manhole Inspection Reports have been taken substantially at the locations indicated on the drawings and shown on the logs. Information presented in the inspection reports, as to extent of manhole failure, infiltration rates; material build up in the manholes; etc. is based on visual observation. Information reported on the Manhole Inspection Reports is those observed in the field at the particular location and at the time observations were made, and do not necessarily represent the present conditions. Condition of the manholes, infiltration rates, and material build up in the manholes, and other factors may differ now from those originally observed. The Contractors should be aware that present conditions might affect methods of construction.

## PART II - MATERIALS

Not applicable.

## PART III - EXECUTION

### 3.01 EXECUTION:

- A. TV Inspection and Manhole Inspection Reports are for the general information of the Contractors. The Contractors are obligated, to examine the site, records of investigations and other data pertinent to the site, and then, based upon their own interpretations and investigations, decide the character and quantity of material to be encountered, the difficulties or obstacles likely to be encountered, and other conditions affecting the work. The TV Inspection and Manhole Inspection Reports are accurate only at the particular locations and times the original inspections were made. No other warranty, either expressed or implied, by the Owner, Engineer or their agents is made to the accuracy of the information contained on TV Inspection and Manhole Inspection Reports, or other data shown on the drawings or presented in the Contract Documents.

END OF SECTION

SECTION 00410

FORM OF GENERAL BID

Proposal of \_\_\_\_\_ (hereinafter called "Bidder")\*

☐ a corporation, organized and existing under the laws of the State of \_\_\_\_\_

☐ a joint venture

☐ a limited liability company

☐ a partnership

☐ an individual doing business as \_\_\_\_\_

\*Insert corporation, partnership, joint venture, limited liability company, or individual as applicable.

To \_\_\_\_\_ (hereinafter called the Owner).

Gentlemen:

The undersigned Bidder, in compliance with your invitation for bids for the construction of **Phase # 10 Sanitary Sewer Rehabilitations**, having examined the plans and specifications with related documents and the site of the proposed work and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all superintendence, labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies, bailing, shoring, removal, and all other things necessary to construct the project in accordance with the contract documents, as prepared by Weston & Sampson Engineers, Inc., within the time set forth therein and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents, of which this bid is a part.

The Bidder hereby agrees that if selected as the Contractor it will commence work under this contract on or before a date to be fixed in the written "Notice to Proceed" given by the Owner to the Contractor and to fully complete the Base Bid is 30 consecutive days, or if selected the Base Bid and Alternate Bid No. 1 is 100 consecutive days, or if selected the Base Bid and Alternate Bid No. 1 and Alternate Bid No. 2 is 115 consecutive days, or if selected the Base Bid and Alternate Bid No. 1 and Alternate Bid No. 2 and Alternate Bid No. 3 is 135 consecutive days, or if selected the Base Bid and Alternate Bid No. 1 and Alternate Bid No. 2 and Alternate Bid No. 3 and Alternate Bid No. 4 is 145 consecutive days of the start date fixed in the "Notice to Proceed." The Contractor shall complete re-test inspections within 35 consecutive days of commencement of re-test inspection. Final paving related to rehabilitations shall be completed prior to May 15, 2019. The Bidder further agrees to pay as liquidated damages the sum of \$1,300 for each consecutive

calendar day thereafter during which the work has not been fully completed, as provided in the "Liquidated Damages" provisions of Section 00800 SUPPLEMENTARY CONDITIONS.

Bidder acknowledges receipt of the following addenda:

No. \_\_\_\_\_ Dated: \_\_\_\_\_

No. \_\_\_\_\_ Dated: \_\_\_\_\_

No. \_\_\_\_\_ Dated: \_\_\_\_\_

No. \_\_\_\_\_ Dated: \_\_\_\_\_

The Bidder agrees to perform the work described in the specifications and shown on the plans for the following lump sum or unit prices:



<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
<b>BASE BID (Items 1 to 9)</b>			
<b>1</b>		<b>Sewer Siphon Complete in Place</b>	
1a	1 l.s.	Pipe burst dual 8-inch (CI) DR-17 sewer siphon pipes, lump sum	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
1b	134 l.f.	Direct bury dual 8-inch (HDPE) DR-17 sewer siphon pipe, per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>2</b>		<b>Sewers Complete in Place</b>	
2a	40 l.f.	6-inch PVC gravity sewer, Sheet C-1, per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
<b>3</b>		<b>Sewer Bypass System</b>	
3a	1 l.s.	Sewer bypass system for siphon replacement, lump sum	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>4</b>		<b>Sewer Manholes and Appurtenances</b>	
4a	1 l.s.	Precast concrete siphon chamber with frames and covers, 8.0 ft. x 4.0 ft., lump sum	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4b	1 manhole	Precast concrete siphon chamber base with frame and cover, 5.0 ft. diameter, per manhole	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
4c	14 v.f.	Precast concrete siphon chamber walls and cone, 5.0 ft. diameter, per vertical foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4d	2 manholes	Remove and dispose of existing siphon structures, per manhole	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>5</b>		<b>Rock Excavation and Disposal</b>	
5a	25 c.y.**	Rock excavation and disposal, per cubic yard (minimum)	<u>\$1,500.00</u>
		Sixty _____	
		and _____ (dollars)	
		Zero _____	
		_____ (cents)	
		(\$ 60.00 _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
5b	25 c.y.**	Rock excavation and disposal, per cubic yard (additional)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>6</b>		<b>Additional Earthwork</b>	
6a	50 c.y.	Test pits, per cubic yard	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
6b	5 c.y.	Additional crushed stone, per cubic yard	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

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\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
6c	5 c.y.	Additional gravel, per cubic yard	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
6d	5 c.y.	Additional controlled density fill, per cubic yard	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>7</b>		<b>Pavement Replacement</b>	
7a	710 s.f.	Type B - Temporary pavement binder course (Trench width, 3 1/2-inches thick), per square foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
7b	710 s.f.	Type B - Temporary pavement top course (Trench width, 2 1/2-inches thick), per square foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
7c	5 tons	Additional pavement, per ton	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>8</b>		<b>Water and Drain Reconstruction</b>	
8a	3 each	Water and drain reconstruction within sewer trench limits, per reconstruction	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figure
<b>9</b>		<b>Mobilization</b>	
9a	1 l.s.	Mobilization, lump sum (not more than 5% of Items 1 to 8)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

The Total Amount of BASE BID (Items 1 to 9, inclusive) is:

\_\_\_\_\_ Dollars  
(In Words)

and \_\_\_\_\_ Cents (\$ \_\_\_\_\_ )  
(In Words) (In Figures)

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
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**ALTERNATE BID NO. 1 (Items 10 to 23)**

**10                      Sewers Complete in Place**

10a	26 l.f.	8-inch PVC gravity sewer, sheets C-4 and C-5, per linear foot	\$ _____
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\_\_\_\_\_ and \_\_\_\_\_ (dollars)

\_\_\_\_\_ (cents)

(\$ \_\_\_\_\_ )

**11                      Building Connection Systems**

11a	1 wye	8x6 inch wye branches for PVC pipe, each	\$ _____
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\_\_\_\_\_ and \_\_\_\_\_ (dollars)

\_\_\_\_\_ (cents)

(\$ \_\_\_\_\_ )

11b	15 l.f.	6-inch PVC building connections, per linear foot	\$ _____
-----	---------	--	----------

\_\_\_\_\_ and \_\_\_\_\_ (dollars)

\_\_\_\_\_ (cents)

(\$ \_\_\_\_\_ )

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.



<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
<b>12</b>		<b>Sewer Manholes and Appurtenances</b>	
12a	4 manholes	Precast concrete manhole base with frame and cover, 4.0 ft. diameter, per manhole	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
12b	24 v.f.	Precast concrete manhole walls and cone, 4.0 ft. diameter, per vertical foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>13</b>		<b>Rock Excavation and Disposal</b>	
13a	25 c.y.**	Rock excavation and disposal, per cubic yard (minimum)	<u>\$1,500.00</u>
		Sixty _____	
		and _____ (dollars)	
		Zero _____	
		_____ (cents)	
		(\$ 60.00 _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
13b	25 c.y.**	Rock excavation and disposal, per cubic yard (additional)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>14</b>		<b>Additional Earthwork</b>	
14a	10 c.y.	Test pits, per cubic yard	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
14b	5 c.y.	Additional crushed stone, per cubic yard	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

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\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
14c	5 c.y.	Additional gravel, per cubic yard	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>15</b>		<b>Pavement Replacement</b>	
15a	30 l.f.	Type A - Temporary pavement (Trench width, 2-inches thick), per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
15b	35 l.f.	Type A - Permanent binder course pavement (Trench width, 2 1/2-inches thick), per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
15c	35 l.f	Type A - Permanent top course pavement (Trench width, 1 1/2-inches thick), per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
15d	5 tons	Additional pavement, per ton	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>16</b>		<b>Water and Drain Reconstruction</b>	
16a	3 each	Water and drain reconstruction within sewer trench limits, per reconstruction	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
<b>17</b>		<b>Sewer Line Chemical Root Treatment</b>	
17a	924 l.f.	Chemical root treatment of 8-inch sewers, per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>18</b>		<b>Cured-in-Place Pipe</b>	
18a	166 l.f.	Cured-in-place pipe for 6-inch sewers, per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
18b	4,778 l.f.	Cured-in-place pipe for 8-inch sewers, per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
18c	101 services	Grout reinstated service connections in 6-inch to 8-inch pipe, per service	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>19</b>		<b>Service Connection Rehabilitation</b>	
19a	6 each	Cut protruding service connections, per service	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>20</b>		<b>Sewer Manhole Rehabilitation</b>	
20a	253 v.f.	Cementitious lining of manholes, per vertical foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
20b	3 manholes	Grout and patch manholes to stop leaks, per manhole	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
20c	7 each	Furnish and install manhole inflow dish, per inflow dish	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
20d	1 set	Replace manhole frame and cover, per set	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

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\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
<b>21</b>		<b>Cleaning and Inspection of Sewers</b>	
21a	1,000 l.f.	Cleaning and inspection of sewers, per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>22</b>		<b>Post Construction Flow Isolation</b>	
22a	4,944 l.f.	Post construction flow isolation of 6-inch to 8-inch sewers, per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

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\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.



Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figure
23		<b>Mobilization</b>	
23a	1 l.s.	Mobilization, lump sum (not more than 5% of Items 10 to 22)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

The Total Amount of ALTERNATE BID NO. 1 (Items 10 to 23, inclusive) is:

\_\_\_\_\_ Dollars  
(In Words)

and \_\_\_\_\_ Cents (\$ \_\_\_\_\_ )  
(In Words) (In Figures)

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
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**ALTERNATE BID NO. 2 (Items 24 to 28)**

**24 Cured-in-Place Pipe**

24a	1,075 l.f.	Cured-in-place pipe for 18-inch sewers, per linear foot	\$ _____
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	and (dollars)
	(cents)
	(\$ _____ )

24b	5 services	Grout reinstated service connections in 18- inch pipe, per service	\$ _____
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	and (dollars)
	(cents)
	(\$ _____ )

**25 Service Connection Rehabilitation**

25a	6 each	Television inspect and test service connections in 8-inch pipe, per service	\$ _____
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	and (dollars)
	(cents)
	(\$ _____ )

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\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal.  
The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
25b	6 each	Grout service connections in 8-inch pipe, per service	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>26</b>		<b>Sewer Manhole Rehabilitation</b>	
26a	24 v.f.	Cementitious lining of manholes, per vertical foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
26b	1 manhole	Raise manhole frame and cover to grade, per manhole	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

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\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
<b>27</b>		<b>Post Construction Flow Isolation</b>	
27a	1,330 l.f.	Post construction flow isolation of 18-inch sewers, per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

<b>28</b>		<b>Mobilization</b>	
28a	1 l.s.	Mobilization, lump sum (not more than 5% of Items 24 to 27)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

The Total Amount of ALTERNATE BID NO. 2 (Items 24 to 28, inclusive) is:

\_\_\_\_\_ Dollars

(In Words)

and \_\_\_\_\_ Cents (\$ \_\_\_\_\_ )  
(In Words) (In Figures)

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
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**ALTERNATE BID NO. 3 (Items 29 to 34)**

**29 Sewer Line Chemical Root Treatment**

29a	262 l.f.	Chemical root treatment of 8-inch sewers, per linear foot	\$ _____
		_____	
		and (dollars)	
		_____	
		(cents)	
		(\$ _____ )	

**30 Cured-in-Place Pipe**

30a	1,341 l.f.	Cured-in-place pipe for 8-inch sewers, per linear foot	\$ _____
		_____	
		and (dollars)	
		_____	
		(cents)	
		(\$ _____ )	

30b	29 services	Grout reinstated service connections in 8- inch pipe, per service	\$ _____
		_____	
		and (dollars)	
		_____	
		(cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal.  
The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
<b>31</b>		<b>Structural Cured-in-Place Pipe</b>	
31a	262 l.f.	Structural cured-in-place pipe for 8-inch sewers, per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
31b	7 services	Grout reinstated service connections in 8-inch pipe, per service	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>32</b>		<b>Sewer Manhole Rehabilitation</b>	
32a	77 v.f.	Cementitious lining of manholes, per vertical foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
32b	3 manholes	Grout and patch manholes to stop leaks, per manhole	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
32c	3 manholes	Raise manhole frame and cover to grade, per manhole	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>33</b>		<b>Post Construction Flow Isolation</b>	
33a	1,603 l.f.	Post construction flow isolation of 8-inch sewers, per linear foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

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\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal.  
The bidder may add to the minimum in Items 5b and 13b.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figure
<b>34</b>		<b>Mobilization</b>	
34a	1 l.s.	Mobilization, lump sum (not more than 5% of Items 29 to 33)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

The Total Amount of ALTERNATE BID NO. 3 (Items 29 to 34, inclusive) is:

\_\_\_\_\_ Dollars  
(In Words)

and \_\_\_\_\_ Cents (\$ \_\_\_\_\_ )  
(In Words) (In Figures)

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.



<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
---------------------	--------------------------------	---	------------------------

**ALTERNATE BID NO. 4 (Items 35 to 40)**

**35 Sewer Line Chemical Root Treatment**

35a	803 l.f.	Chemical root treatment of 8-inch sewers, per linear foot	\$ _____
		_____	
		and (dollars)	
		_____	
		(cents)	
		(\$ _____ )	

**36 Cured-in-Place Pipe**

36a	900 l.f.	Cured-in-place pipe for 8-inch sewers, per linear foot	\$ _____
		_____	
		and (dollars)	
		_____	
		(cents)	
		(\$ _____ )	

36b	13 services	Grout reinstated service connections in 8- inch pipe, per service	\$ _____
		_____	
		and (dollars)	
		_____	
		(cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal.  
The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
<b>37</b>		<b>Service Connection Rehabilitation</b>	
37a	1 each	Cut protruding service connections, per service	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>38</b>		<b>Sewer Manhole Rehabilitation</b>	
38a	35 v.f.	Cementitious lining of manholes, per vertical foot	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
38b	3 manholes	Build manhole bench and invert, per manhole	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
-----------------	----------------------------	---	------------------------

**39 Post Construction Flow Isolation**

39a 900 l.f. Post construction flow isolation of 8-inch sewers, per linear foot \$ \_\_\_\_\_

\_\_\_\_\_ and \_\_\_\_\_ (dollars)  
 \_\_\_\_\_ (cents)  
 (\$ \_\_\_\_\_ )

**40 Mobilization**

40a 1 l.s. Mobilization, lump sum (not more than 5% of Items 35 to 39) \$ \_\_\_\_\_

\_\_\_\_\_ and \_\_\_\_\_ (dollars)  
 \_\_\_\_\_ (cents)  
 (\$ \_\_\_\_\_ )

The Total Amount of ALTERNATE BID NO. 4 (Items 35 to 40, inclusive) is:

\_\_\_\_\_ Dollars

(In Words)

and \_\_\_\_\_ Cents (\$ \_\_\_\_\_ )  
 (In Words) (In Figures)

\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
---------------------	--------------------------------	---	------------------------

TOTAL AMOUNT OF BASE BID (Items 1 to 9)

\$ \_\_\_\_\_ (\$ \_\_\_\_\_ )  
(In Words) (In Figures)

TOTAL AMOUNT OF BASE BID PLUS ALTERNATE BID NO. 1 (Items 1 to 23)

\$ \_\_\_\_\_ (\$ \_\_\_\_\_ )  
(In Words) (In Figures)

TOTAL AMOUNT OF BASE BID PLUS ALTERNATE BID NO. 1 PLUS ALTERNATE BID NO. 2 (Items 1 to 28)

\$ \_\_\_\_\_ (\$ \_\_\_\_\_ )  
(In Words) (In Figures)

TOTAL AMOUNT OF BASE BID PLUS ALTERNATE BID NO. 1 PLUS ALTERNATE BID NO. 2 PLUS ALTERNATE BID NO. 3 (Items 1 to 34)

\$ \_\_\_\_\_ (\$ \_\_\_\_\_ )  
(In Words) (In Figures)

TOTAL AMOUNT OF BASE BID PLUS ALTERNATE BID NO. 1 PLUS ALTERNATE BID NO. 2 PLUS ALTERNATE BID NO. 3 PLUS ALTERNATE BID NO. 4 (Items 1 to 40)

\$ \_\_\_\_\_ (\$ \_\_\_\_\_ )  
(In Words) (In Figures)

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\*Quantity assumed for comparison of bids.

\*\*The unit price in Items 5a and 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Items 5b and 13b.

All entries shall be made clearly in ink or typewritten. Amounts are to be shown in both words and figures. In case of discrepancy between the prices written in words and those written in figures, the amount shown in words shall govern. In the event there is a discrepancy between the unit prices and the total sum of all of the items (the computed contract price), the unit prices shall govern.

The above unit prices shall include all superintendence, labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies, bailing, shoring, removal, and all other things necessary to cover the finished work of the several kinds called for.

The Bidder understands that all bids for this project are subject to the applicable bidding laws of the Commonwealth of Massachusetts, including General Laws Chapter 30, Section 39M, as amended.

The contract will be awarded to the lowest responsible and eligible bidder.

The Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 days, Saturdays, Sundays and legal holidays excluded, after the opening of bids.

Within 10 days of receipt of the written notice of acceptance of this bid, the Bidder will execute the formal agreement attached in Section 00520, AGREEMENT.

Bid security is attached in the sum of five percent (5%) of the total bid in accordance with the conditions of Section 00200, INSTRUCTIONS TO BIDDERS. The bid security may become the property of the Owner in the event the contract and bond are not executed within the time set forth above.

The selected Contractor shall furnish a performance bond and a payment bond in an amount at least equal to one hundred percent (100%) of the contract prices in accordance with Section 00610, PERFORMANCE BOND, Section 00615, PAYMENT BOND, and as stipulated in Paragraph 5.01 of Section 00700, GENERAL CONDITIONS of these specifications.

The undersigned offers the following information as evidence of its qualifications to perform the work as bid upon according to all the requirements of the plans and specifications.

1. Have been in business under present name for \_\_\_\_\_ years.
2. The names and addresses of all persons interested in the bid (if made by a partnership or corporation) as Principals are as follows:

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(Attach supplementary list if necessary)

3. The Bidder shall state below what work of a similar character to that included in the proposed contract it has done, and give references that will enable the Owner to judge its experience, skill and business standing (add supplementary page if necessary).

Completion Date	Project Name	Contract Amount	Design Engineer	Reference Name	Telephone No.
a.					
b.					
c.					
d.					
e.					
f.					

Pursuant to M.G.L. CH. 62C, Sec 49A, the undersigned Bidder certifies under the penalties of perjury that it is in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

Minority-owned Business Enterprise (MBE), Women-owned Business Enterprise (WBE) and Equal Employment Opportunity policies of the Massachusetts Water Resources Authority (MWRA) are applicable to this Contract. The Contractor shall comply with all applicable laws and regulations pertaining to nondiscrimination, equal opportunity and affirmative action, including without limitation executive orders and rules and regulations of federal and state agencies of competent jurisdiction. The Contractor shall make positive efforts to achieve: (1) a minority employee work force goal of 15.3 percent, (2) a woman employee work force goal of 6.90 percent, (3) a goal of 7.24 percent participation of Minority-owned Business Enterprise(s), and (4) a goal of 3.60 percent participation of Woman-owned Business Enterprise(s) within project contracts. At a minimum, the Contractor should allow MBEs and WBEs the maximum feasible opportunity to compete for subagreements to be performed under the project.

The undersigned Bidder hereby certifies it will comply with the specific affirmative action steps contained in the EEO/AA provisions of this Contract, including compliance with the Disadvantaged Business Enterprise provisions as required under these contract provisions. The contractor receiving the award of the contract shall incorporate the EEO/AA provisions of this contract into all subcontracts and purchase orders so that such provisions will be binding upon each subcontractor or vendor.

The undersigned Bidder hereby certifies that (1) it is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and 3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

The undersigned certifies under penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

The undersigned Bidder hereby certifies, under pains and penalties of perjury, that the foregoing bid is based upon the payment to laborers to be employed on the project of wages in an amount no less than the applicable prevailing wage rates established for the project by the Massachusetts Department of Labor and Workforce Development. The undersigned bidder agrees to indemnify the awarding authority for, from and against any loss, expense, damages, actions or claims, including any expense incurred in connection with any delay or stoppage of the project work arising out of or as a result of (1) the failure of the said bid to be based upon the payment of



the said applicable prevailing wage rates or (2) the failure of the bidder, if selected as the Contractor, to pay laborers employed on the project the said applicable prevailing wage rates.

The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth of Massachusetts under the provisions of Section Twenty-Nine F of Chapter Twenty-Nine, Section 25C (10) of Chapter 152 (workers' compensation) or any other applicable debarment provisions of any other Chapter of the General Laws or any rule or regulations promulgated thereunder;

Respectfully submitted:

Date \_\_\_\_\_

By \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Name - Typed or Printed)

\_\_\_\_\_  
(Title)

(SEAL - if bid is by a corporation)

\_\_\_\_\_  
(Business Name)

\_\_\_\_\_  
(Federal ID Number)

\_\_\_\_\_  
(Business Address)

\_\_\_\_\_  
(City and State)

\_\_\_\_\_  
(Telephone Number)

\_\_\_\_\_  
(Fax Number)

END OF SECTION

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SECTION 00520

AGREEMENT

THIS AGREEMENT, made this \_\_\_\_\_ day of \_\_\_\_\_, 2018, by and between the Town of Arlington, Massachusetts, hereinafter called "OWNER," acting herein through its Town Manager, and doing business as (a corporation) (a limited liability company) (a partnership) (a joint venture) (an individual)\* located in the (City) (Town)\* of \_\_\_\_\_, County of \_\_\_\_\_, and State of \_\_\_\_\_, hereinafter called "CONTRACTOR."

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the OWNER, the CONTRACTOR hereby agrees with the OWNER to commence and complete the project described as follows:

**PHASE # 10 SANITARY SEWER REHABILITATIONS  
BID INVITATION NO. 18-32**

hereinafter called the project, for the sum of \_\_\_\_\_ Dollars and \_\_\_\_\_ Cents (\$ \_\_\_\_\_) and all extra work in connection therewith, under the terms as stated in the Contract Documents; and at its own proper cost and expense to furnish superintendence, labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies, bailing, shoring, removal, and all other things necessary to complete the said project in accordance with the conditions and prices stated in Section 00410, FORM OF GENERAL BID, Section 00700, GENERAL CONDITIONS, Section 00800, SUPPLEMENTARY CONDITIONS, Section 00830, STATE REGULATIONS, the plans, which include all maps, plates, drawings, blue prints, and the specifications and all other contract documents therefor as prepared by Weston & Sampson Engineers, Inc., including all bid documents.

The CONTRACTOR hereby agrees to commence work under this contract on or before a date to be fixed in the written Notice to Proceed given by the OWNER to the CONTRACTOR and to fully complete the Base Bid within 30 consecutive days, or if selected the Base Bid and Alternate Bid No. 1 within 100 consecutive days, or if selected the Base Bid and Alternate Bid No. 1 and Alternate Bid No. 2 within 115 consecutive days, or if selected the Base Bid and Alternate Bid No. 1 and Alternate Bid No. 2 and Alternate Bid No. 3 within 135 consecutive days, or if selected the Base Bid and Alternate Bid No. 1 and Alternate Bid No. 2 and Alternate Bid No. 3 and Alternate Bid No. 4 within 145 consecutive days of the start date fixed in the Notice to Proceed. The CONTRACTOR shall complete re-test inspection within 35 consecutive calendar days of commencement of re-test inspection. Final paving related to rehabilitations shall be completed prior to May 15, 2019. The CONTRACTOR further agrees to pay as liquidated damages the sum of \$1,300 for each consecutive calendar day thereafter during which the work has not been

fully completed, as provided in the Liquidated Damages provisions of Section 00800, SUPPLEMENTARY CONDITIONS.

Minority-owned Business Enterprise (MBE), Women-owned Business Enterprise (WBE) and Equal Employment Opportunity polices of the Massachusetts Water Resources Authority (MWRA) are applicable to this Contract. The Contractor shall comply with all applicable laws and regulations pertaining to nondiscrimination, equal opportunity and affirmative action, including without limitation executive orders and rules and regulations of federal and state agencies of competent jurisdiction. The Contractor shall make positive efforts to achieve: (1) a minority employee work force goal of 15.3 percent, (2) a woman employee work force goal of 6.90 percent, (3) a goal of 7.24 percent participation of Minority-owned Business Enterprise(s), and (4) a goal of 3.60 percent participation of Woman-owned Business Enterprise(s) within project contracts. At a minimum, the Contractor should allow MBEs and WBEs the maximum feasible opportunity to compete for subagreements to be performed under the project.

The CONTRACTOR shall not discriminate against or exclude any person from participation herein on grounds of race, color, religious creed, national origin, sex, sexual orientation, ancestry, or age; and that it shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, color, religious creed, national origin, sex, sexual orientation, ancestry, age, or handicapped status.

The CONTRACTOR shall not participate in or cooperate with an international boycott, as defined in Section 999 (b)(3) and (4) of the Internal Revenue Code of 1986, as amended, or engage in conduct declared to be unlawful by Section 2 of Chapter 151E of the Massachusetts General Laws.

Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Agreement and any provision in violation of the foregoing shall be deemed null, void and of no effect. Where conflict between Federal and State Laws and Regulations exists, the more stringent requirement shall apply.

Subject to G.L. c.30, sec. 39K and/or sec. 39G and G.L. c.30, sec. 39F, as applicable, the OWNER agrees to pay the CONTRACTOR in current funds for the performance of the Agreement, subject to additions and deductions, as provided in Section 00700, GENERAL CONDITIONS, and to make payments on account thereof as provided in Section 00700, GENERAL CONDITIONS and Section 00800, SUPPLEMENTARY CONDITIONS

In accordance with the requirements of G.L. c.149, §27B, the Contractor shall submit, and shall require all of its subcontractors required to keep a record of hours and wages paid to laborers employed on the project to submit, to the awarding authority on a weekly basis, copies of such records. All such weekly submissions shall be accompanied by the following certification:

The undersigned contractor hereby certifies, under the pains and penalties of perjury, that the foregoing payroll records are true and accurate records of the wages paid to laborers employed on the project for the period stated and said wages are in an amount no less than the prevailing wage rates established for the project by the Massachusetts Department of Labor and Workforce Development. The undersigned contractor agrees, in addition to any other remedies available to the awarding authority, to indemnify the awarding authority

for, from and against any loss, expense, damages, actions or claims, including any expense incurred in connection with any delay or stoppage of the project work, arising out of or as a result of (1) the contractor's failure to pay laborers employed on the project the said applicable prevailing wage rates; (2) the failure of the foregoing payroll records to accurately state the said applicable prevailing wage rates; or (3) the failure of the foregoing payroll records to accurately represent the wages actually paid to laborers employed on the project.

IN WITNESS WHEREOF, the parties to these presents have executed this Agreement in six (6) counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

AGREED:

\_\_\_\_\_  
Town of Arlington, Massachusetts  
(Owner)

By

\_\_\_\_\_  
Adam W. Chapdelaine  
(Name)  
\_\_\_\_\_  
Town Manager  
(Title)

By

\_\_\_\_\_  
(Contractor)  
\_\_\_\_\_  
(Name)  
\_\_\_\_\_  
(Title)  
\_\_\_\_\_  
(Address)  
\_\_\_\_\_  
(City and State)

Approved as to Form:

By

\_\_\_\_\_  
(Owner's Counsel)  
\_\_\_\_\_  
(Name)

In accordance with M.G.L. C.44, Section 31C, this is to certify that an appropriation in the amount of this Contract is available therefor and that the Town of Arlington, Massachusetts has been authorized to execute the Contract and approve all requisitions and change orders.

By

\_\_\_\_\_  
(Owner's Accountant)  
\_\_\_\_\_  
(Name)

CERTIFICATE OF VOTE  
(to be filed if Contractor is a Corporation)

I, \_\_\_\_\_, hereby certify that I am the duly qualified and acting Secretary of  
(Secretary of Corporation)  
\_\_\_\_\_ and I further certify that a meeting of the Directors of said company,  
(Name of Corporation)  
duly called and held on \_\_\_\_\_, at which all members were present and voting, the  
(Date of Meeting)  
following vote was unanimously passed:

VOTED: To authorize and empower

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Anyone acting singly, to execute Forms of General Bid, Contracts or Bonds on behalf of the Corporation.

I further certify that the above vote is still in effect and has not been changed or modified in any respect.

By: \_\_\_\_\_  
(Secretary of Corporation)

A True Copy:

Attest: \_\_\_\_\_  
(Notary Public)

My Commission Expires: \_\_\_\_\_  
(Date)

Contractor's Certification

A Contractor will not be eligible for award of a contract unless such Contractor has submitted the following certification, which is deemed a part of the resulting contract:

CONTRACTOR'S CERTIFICATION

---

Name of the General Contractor

certifies that it:

1. Will not discriminate in their employment practices;
2. Intends to use the following listed construction trades in the work under the contract:

---

and

---

3. Will make good faith efforts to comply with the minority employee and women employee workforce participation ratio goals and specific affirmative action steps contained herein; and
4. Is in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices; and
5. Will provide the provisions of the "Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program" to each and every subcontractor employed on the Project and will incorporate the terms of this Section into all subcontracts and work orders entered into on the Project.
6. Agrees to comply with all provisions contained herein.

---

Signature of authorized representative of Contractor

Date

---

Printed name of authorized representative of Contractor

Contractor's Certification (Continued)

**CERTIFICATE OF NON-COLLUSION**

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean natural person, business, partnership, corporation, committee, union, club or other organization, entity, or group of individuals.

Signature\_\_\_\_\_

Date\_\_\_\_\_

\_\_\_\_\_  
Print Name & Title

\_\_\_\_\_  
Company Name

**CERTIFICATE OF TAX COMPLIANCE**

Pursuant to Chapter 62C of the Massachusetts General Laws, Section 49A (b), I

\_\_\_\_\_, authorized signatory for \_\_\_\_\_  
*Name of individual* *Name of contractor*

do hereby certify under the pains and penalties of perjury that said contractor has complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**LABOR HARMONY AND OSHA TRAINING REQUIREMENTS**

The undersigned certifies under penalties of perjury that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed at the work and that all employees to be employed at the worksite and in the work will have completed an OSHA-approved construction safety and health course lasting at least ten (10) hours.

Signature\_\_\_\_\_

Date\_\_\_\_\_

\_\_\_\_\_  
Print Name & Title

\_\_\_\_\_  
Company Name



Subcontractor's Certification

Prior to the award of any subcontract, regardless of tier, the prospective subcontractor must execute and submit to the General Contractor the following certification, which will be deemed a part of the resulting subcontract:

SUBCONTRACTOR'S CERTIFICATION

---

Name of the Subcontractor

certifies that it:

7. Will not discriminate in their employment practices;
8. Intends to use the following listed construction trades in the work under the contract:

---

and

---

9. Will make good faith efforts to comply with the minority employee and women employee workforce participation ratio goals and specific affirmative action steps contained herein; and
10. Is in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices; and
11. Will provide the provisions of the "Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program" to each and every subcontractor employed on the Project and will incorporate the terms of this Section into all subcontracts and work orders entered into on the Project.
12. Agrees to comply with all provisions contained herein.

---

Signature of authorized representative of Subcontractor

Date

---

Printed name of authorized representative of Subcontractor

END OF SECTION

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SECTION 00610

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we \_\_\_\_\_  
(Name of Contractor)  
a \_\_\_\_\_ hereinafter called "Principal" and  
(Corporation, Partnership, Joint Venture, LLC or Individual)  
\_\_\_\_\_ of \_\_\_\_\_, State of \_\_\_\_\_  
(Surety) (City)  
hereinafter called the "Surety" and licensed by the State Division of Insurance to do business under the laws of the Commonwealth of Massachusetts, are held and firmly bound to the Town of Arlington, Massachusetts, hereinafter called "Owner", in the penal sum of \_\_\_\_\_ Dollars and \_\_\_\_\_ Cents (\$ \_\_\_\_\_) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal has entered into a certain contract with the Owner (the "Contract"), dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, which Contract is by reference made a part hereof, for the construction described as follows:

**PHASE # 10 SANITARY SEWER REHABILITATIONS  
BID INVITATION NO. 18-32**

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of the Contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under the Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise, this obligation shall remain in full force and effect.

PROVIDED, FURTHER, that the Surety's obligation under this Bond shall arise after (1) the Owner has declared the Principal in default of the Contract or any provision thereof, or (2) has declared that the Principal has failed, or is otherwise unable or unwilling, to execute the work consistent with, and in conformance to, the Contract (collectively referred to as a "Contractor Default"). The determination of a Contractor Default shall be made solely by the Owner. The Owner need not terminate the Contract to declare a Contractor Default or to invoke its rights under this Bond, and Contractor hereby agrees not to assert any claims against Surety under any indemnity or similar agreements on the grounds that Surety has interfered with the Contract by fulfilling its obligations hereunder in the absence of a termination of said Contract.

When the Surety's obligation under this Bond arises, the Surety, at its sole expense and at the consent and election of the Owner, shall promptly take one of following steps: (1) arrange for the Principal to perform and complete the work of the Contract; (2) arrange for a contractor other

than the Principal to perform and complete the work of the Contract; (3) reimburse the Owner, in a manner and at such time as the Owner shall reasonably decide, for all costs and expenses incurred by the Owner in performing and completing the work of the Contract. Surety will keep Owner reasonably informed of the progress, status and results of any investigation of any claim of the Owner.

If the Surety does not proceed as provided in this Bond with due diligence and all deliberate speed, the Surety shall be deemed to be in default of this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner.

After the Surety's obligation under this Bond arises, the Surety is obligated, to the limit of the amounts of this Bond, for (1) the correction of defective work and completion of the Contract; (2) additional design, professional services, and legal costs, including attorney's fees, resulting from the Contractor Default or from the default of the Surety under this Bond; (3) any additional work beyond the Contract made necessary by the Contractor Default or default of the Surety under this Bond; (4) indemnification obligations of the Principal, if any, as provided in the Contract; and (5) liquidated damages as provided in the Contract, or if no such damages are specified, actual damages and consequential damages resulting from the Contractor Default or any default of the Surety under this Bond.

Any proceeding, legal or equitable, under this Bond shall be instituted in any court of competent jurisdiction in the Commonwealth of Massachusetts.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

The Surety providing the Bond shall have a rating of A or better within Best's Key Rating Guide.

IN WITNESS WHEREOF, this instrument is executed in \_\_\_\_\_ ( ) counterparts, each one of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

ATTEST:

_____	_____
Principal	Witness as to Principal Signature
By _____	_____
Signature	Name and Title
_____	_____
Name and Title	Address
_____	_____
Address	City and State
_____	
City and State	(SEAL)

ATTEST:

_____	_____
Surety	Witness as to Surety Signature
By _____	_____
Attorney-in-Fact Signature	Name and Title
_____	_____
Name and Title	Address
_____	_____
Address	City and State
_____	
City and State	(SEAL)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners should execute Bond.

END OF SECTION

SECTION 00615

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That we \_\_\_\_\_  
(Name of Contractor)  
a \_\_\_\_\_ hereinafter called  
"Principal" (Corporation, Partnership, Joint Venture, Limited Liability Company, or Individual)  
and \_\_\_\_\_ of \_\_\_\_\_, State of \_\_\_\_\_  
(Surety) (City) (State)  
hereinafter called "Surety" and licensed by the State Division of Insurance to do business under  
the laws of the Commonwealth of Massachusetts are held and firmly bound to the Town of  
Arlington, Massachusetts, hereinafter called "Owner," in the penal sum of \_\_\_\_\_  
\_\_\_\_\_ Dollars and \_\_\_\_\_  
\_\_\_\_\_ Cents (\$\_\_\_\_\_) in lawful money of the United States, for the  
payment of which sum well and truly to be made, we bind ourselves, our heirs, executors,  
administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal has  
entered into a certain contract with the Owner (the "Contract"), dated the \_\_\_\_\_ day of \_\_\_\_\_  
\_\_\_\_\_, 20\_\_\_\_, which Contract is by reference made a part hereof, for the construction  
described as follows:

**PHASE # 10 SANITARY SEWER REHABILITATIONS  
BID INVITATION NO. 18-32**

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms,  
subcontractors, and corporations furnishing materials for or performing labor in the prosecution of  
the work provided for in such contract, and any authorized extension or modification thereof,  
including all amounts due for materials, lubricants, oil, gasoline, repairs on machinery, equipment  
and tools, consumed or used in connection with the construction of such work, and all insurance  
premiums on said work, and for all labor, performed in such work whether by subcontractor or  
otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and  
agrees that no change, extension of time, alteration or addition to the terms of the Contract or to  
the work to be performed thereunder or the specifications accompanying the same shall in any way  
affect its obligation on this bond, and it does hereby waive notice of any such change, extension  
of time, alteration or addition to the terms of this Contract or to the work or to the specifications.  
The Surety Company providing the bond shall have a rating of A or better within the Best Key  
Rating Guide.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor  
shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in \_\_\_\_\_ ( ) counterparts, each one of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

ATTEST:

_____	_____
Principal	Witness as to Principal Signature
By _____	_____
Signature	Name and Title
_____	_____
Name and Title	Address
_____	_____
Address	City and State
_____	
City and State	(SEAL)

ATTEST:

_____	_____
Surety	Witness as to Surety Signature
By _____	_____
Attorney-in-Fact Signature	Name and Title
_____	_____
Name and Title	Address
_____	_____
Address	City and State
_____	
City and State	(SEAL)

NOTE:            Date of Bond must not be prior to date of Contract.    If Contractor is a Partnership, all partners should execute Bond.

END OF SECTION

SECTION 00700

GENERAL CONDITIONS

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

## STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by





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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
  3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
  4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  5. *Bidder*—An individual or entity that submits a Bid to Owner.
  6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
  7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
  8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
  9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
  10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision

regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.



25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.
35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.

38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

## 1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
    - a. does not conform to the Contract Documents; or
    - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
    - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
  3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
  4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words

“furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2 – PRELIMINARY MATTERS**

### **2.01 *Delivery of Bonds and Evidence of Insurance***

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

### **2.02 *Copies of Documents***

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

### **2.03 *Before Starting Construction***

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
  - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
  - 2. a preliminary Schedule of Submittals; and
  - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

#### 2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

#### 2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
  - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
  - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
  - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

#### 2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

## ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

### 3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

### 3.02 *Reference Standards*

- A. Standards Specifications, Codes, Laws and Regulations
  - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

### 3.03 *Reporting and Resolving Discrepancies*

- A. *Reporting Discrepancies:*
  - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
  3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.
- B. *Resolving Discrepancies:*
1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
    - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
    - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

### 3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

### 3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
  - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
  - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

## **ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK**

### 4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

### 4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

### 4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

### 4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
  - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.



2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

#### 4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
  1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
  2. abnormal weather conditions;
  3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
  4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.
- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

## ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

### 5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

### 5.02 *Use of Site and Other Areas*

- A. *Limitation on Use of Site and Other Areas:*
  - 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
  - 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste

materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

- C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

#### 5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings*: The Supplementary Conditions identify:
  - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
  - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
  - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
  - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
  - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
  - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

#### 5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:
  - 1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
  - 2. is of such a nature as to require a change in the Drawings or Specifications; or
  - 3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
  1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
    - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
    - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
  2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
    - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
    - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site

and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

- c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
- 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
- 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

#### 5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
  - 1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
  - 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
    - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
    - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
    - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
    - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.
- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and

recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
  - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
    - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
    - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
    - d. Contractor gave the notice required in Paragraph 5.05.B.
  - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
  - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

#### 5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
  - 1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
  - 2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer,

or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
  2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

## **ARTICLE 6 – BONDS AND INSURANCE**

### **6.01 *Performance, Payment, and Other Bonds***

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond



signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

#### 6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor

to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

#### 6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
  - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
  - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).
  - 4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
  - 1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
  - 2. claims for damages insured by reasonably available personal injury liability coverage.
  - 3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
  - 1. Products and completed operations coverage:
    - a. Such insurance shall be maintained for three years after final payment.

- b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
  2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
  3. Broad form property damage coverage.
  4. Severability of interest.
  5. Underground, explosion, and collapse coverage.
  6. Personal injury coverage.
  7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
  8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.
- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial

Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

- I. *General provisions:* The policies of insurance required by this Paragraph 6.03 shall:
  - 1. include at least the specific coverages provided in this Article.
  - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
  - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
  - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
  - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

#### 6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

#### 6.05 *Property Insurance*

- A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
  - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."

2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
  3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
  4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).
  5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
  6. extend to cover damage or loss to insured property while in transit.
  7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
  8. allow for the waiver of the insurer's subrogation rights, as set forth below.
  9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
  10. not include a co-insurance clause.
  11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
  12. include performance/hot testing and start-up.
  13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change*: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this

Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

- C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

#### 6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
  - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by,

arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

#### 6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

### **ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES**

#### 7.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

#### 7.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

#### 7.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

#### 7.04 *"Or Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
  - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:



- a. in the exercise of reasonable judgment Engineer determines that:
    - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
    - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
    - 3) it has a proven record of performance and availability of responsive service; and
    - 4) it is not objectionable to Owner.
  - b. Contractor certifies that, if approved and incorporated into the Work:
    - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
    - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

#### 7.05 Substitutes

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
  - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
  - a. shall certify that the proposed substitute item will:
    - 1) perform adequately the functions and achieve the results called for by the general design,
    - 2) be similar in substance to that specified, and
    - 3) be suited to the same use as that specified.
  - b. will state:
    - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
    - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
    - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
  - c. will identify:
    - 1) all variations of the proposed substitute item from that specified, and
    - 2) available engineering, sales, maintenance, repair, and replacement services.
  - d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the

Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.
- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.
- O. Nothing in the Contract Documents:
  - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
  - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

#### **7.07 *Patent Fees and Royalties***

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the

performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

#### 7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

#### 7.09 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

#### 7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if

any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

#### 7.11 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

#### 7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
  - 1. all persons on the Site or who may be affected by the Work;
  - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly

or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

- F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
- G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

#### 7.13 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

#### 7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

#### 7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

#### 7.16 *Shop Drawings, Samples, and Other Submittals*

- A. *Shop Drawing and Sample Submittal Requirements:*
  - 1. Before submitting a Shop Drawing or Sample, Contractor shall have:
    - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
    - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
    - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
    - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
  - 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.
1. *Shop Drawings:*
    - a. Contractor shall submit the number of copies required in the Specifications.
    - b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.
  2. *Samples:*
    - a. Contractor shall submit the number of Samples required in the Specifications.
    - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.
  3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. *Engineer's Review:*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
  2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
  3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
  4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and



Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.

5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
  1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;
  2. recommendation by Engineer or payment by Owner of any progress or final payment;
  3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  4. use or occupancy of the Work or any part thereof by Owner;
  5. any review and approval of a Shop Drawing or Sample submittal;
  6. the issuance of a notice of acceptability by Engineer;
  7. any inspection, test, or approval by others; or
  8. any correction of defective Work by Owner.
- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

#### 7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

### **ARTICLE 8 – OTHER WORK AT THE SITE**

#### 8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or

alter others' work with the written consent of Engineer and the others whose work will be affected.

- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

#### 8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
  - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
  - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
  - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

#### 8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual

rights against Contractor with respect to the breach of the obligations set forth in this paragraph.

- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.
- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

## **ARTICLE 9 – OWNER'S RESPONSIBILITIES**

### **9.01    *Communications to Contractor***

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

### **9.02    *Replacement of Engineer***

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

### **9.03    *Furnish Data***

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

### **9.04    *Pay When Due***

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

### **9.05    *Lands and Easements; Reports, Tests, and Drawings***

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

## **ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION**

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On

the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

#### 10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

#### 10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

#### 10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

#### 10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

#### 10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

#### 10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in

contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

#### 10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

### **ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

#### 11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
  - 1. *Change Orders:*
    - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
    - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
  - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents



governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

#### 11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

#### 11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

#### 11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
  1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).
- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
    - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
    - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
    - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

#### 11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

#### 11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
  2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
  3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

#### 11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
  2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
  3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
  4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

#### 11.08 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

### ARTICLE 12 – CLAIMS

#### 12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
  - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
  - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
  - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
  - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
  - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal

and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

## **ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### **13.01 Cost of the Work**

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
  1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
  2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
  1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing

Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
  - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
  - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or

indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

## 13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

- B. *Cash Allowances*: Contractor agrees that:
  - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
  - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

### 13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
  - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
  - 2. there is no corresponding adjustment with respect to any other item of Work; and
  - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.



## ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

### 14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

### 14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
  - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
  - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
  - 3. by manufacturers of equipment furnished under the Contract Documents;
  - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
  - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

#### 14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

#### 14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

#### 14.05 *Uncovering Work*

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
  - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
  - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

#### 14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

#### 14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

## **ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

### **15.01 *Progress Payments***

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
  2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
  3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
  2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
    - a. the Work has progressed to the point indicated;
    - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon

Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

- c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
  - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
  - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
  - a. to supervise, direct, or control the Work, or
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
  - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
  - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
  - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
  - a. the Work is defective, requiring correction or replacement;
  - b. the Contract Price has been reduced by Change Orders;
  - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
  - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
  - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
  - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
  - c. Contractor has failed to provide and maintain required bonds or insurance;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
  - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
  - f. the Work is defective, requiring correction or replacement;
  - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - h. the Contract Price has been reduced by Change Orders;
  - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
  - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
  - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - l. there are other items entitling Owner to a set off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

#### 15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

#### 15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

#### 15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
  - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
  - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
  - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

#### 15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 15.06 *Final Payment*

- A. *Application for Payment:*
  - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.



2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents;
  - b. consent of the surety, if any, to final payment;
  - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
  - d. a list of all disputes that Contractor believes are unsettled; and
  - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

**B. *Engineer's Review of Application and Acceptance:***

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

- C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

#### 15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

#### 15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
  - 1. correct the defective repairs to the Site or such other adjacent areas;
  - 2. correct such defective Work;
  - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

## ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

### 16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

### 16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
  - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
  - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
  - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
  - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
  - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
  - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When

exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

#### 16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
  - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
  - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

#### 16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

## ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

### 17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
  - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
  - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
  - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
  - 2. agree with the other party to submit the dispute to another dispute resolution process; or
  - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

## ARTICLE 18 – MISCELLANEOUS

### 18.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
  - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
  - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

### 18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

### 18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SECTION 00800

SUPPLEMENTARY CONDITIONS

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## SUPPLEMENTARY CONDITIONS

### AMENDMENTS TO GENERAL CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC C-700, 2013 edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

#### ARTICLE 1. DEFINITIONS AND TERMINOLOGY

Delete the words "The individual or entity named as such in the Agreement" in 1.01.A.20 of the General Conditions, "Engineer", and insert the following in their place:

"The individual or entity duly appointed by the Owner to undertake the duties and powers herein assigned to the Engineer, acting either directly or through duly appointed representatives."

#### ARTICLE 2. PRELIMINARY MATTERS

##### SC-2.02

Delete paragraph 2.02A of the General Conditions in its entirety and insert the following in its place:

"A. Owner shall furnish to Contractor paper copies of the Contract Documents."

##### SC-2.03

"Delete paragraph 2.03 A.3 of the General Conditions."

##### SC-2.05

Delete paragraph 2.05 A.3 of the General Conditions and replace with the following.

3. Contractor's Schedule of Values for Lump Sum Items will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Lump Sum Price to the component parts of the Work associated with the Lump Sum Item.

#### ARTICLE 3. DOCUMENTS: INTENT, REQUIREMENTS, REUSE

##### SC-3.01

Add the following sentence at the end of Paragraph 3.01A of the General Conditions:

"...by all. Each and every provision of law and clause required by law to be inserted in these Contract Documents shall be deemed to be inserted herein, and they shall be read and enforced



as though it were included herein, and if through mistake or otherwise, any such provision is not inserted, or if not correctly inserted, then upon the application of either party, the Contract Documents shall forthwith be physically amended to make such insertion."

### SC-3.03

Delete the last phrase of paragraph 3.03 A.3 of the General Conditions starting with "had", and substitute the following:

"knew or reasonably should have known thereof."

## ARTICLE 4. COMMENCEMENT AND PROGRESS OF THE WORK

### SC-4.01

Add a new paragraph immediately after paragraph 4.01A of the General Conditions which is to read as follows:

"B. Notwithstanding the time limitations provided in paragraph 4.01A, the OWNER may desire to commence the Contract Times later than the sixtieth day after the bid opening. The OWNER and CONTRACTOR, upon mutual agreement, may extend the commencement of the Contract Times to any date that they elect. OWNER must obtain CONTRACTOR's approval for extending the time beyond the dates/times stated in the Contract Documents."

### SC-4.03

Add a new paragraph immediately after paragraph 4.03A of the General Conditions which is to read as follows:

"B. Engineer may check the lines, elevations and reference marks set by Contractor, and Contractor shall correct any errors disclosed by such check. Such a check shall not be considered as approval of Contractor's work and shall not relieve Contractor of the responsibility for construction of the entire Work in accordance with the Contract Documents. Contractor shall furnish personnel to assist Engineer in checking lines and grades."

### SC-4.05

Delete Article 4.05A in its entirety and replace with the following:

"A. The Contractor hereby agrees that the Contractor shall have no claim for damages of any kind against the Owner or the Designer on account of any delay in the commencement or performance of any of the work or any delay or suspension of any portion of the work, whether such delay is caused by the Owner, the Designer, or otherwise except as provided for within the prevailing statutes. The Contractor acknowledges that the Contractor's sole remedy for any such delay and/or suspension will be an extension of time as provided in the Contract Documents. The Contractor will under no circumstances be eligible for additional compensation on account of any delay even if an extension of time is granted by the Owner.

Delete Article 4.05G in its entirety and replace it with the following:

- “G. Change Order requests for an extension of time under this paragraph must be submitted no later than 14 calendar days from the commencement of the event giving rise to the claimed delay, and must be accompanied by a detailed analysis identifying each action(s) or additional work item(s) which caused the delay and identifying exactly which items along the critical path were impacted or delayed. Accumulating the amount of time required to complete a series of additional work items or delays and adding this time to the original Contract Time will not be considered justification for an extension of time. To justify an extension of Contract Time, the Contractor must prove clearly and convincingly that the critical path for construction has been impacted by circumstances beyond the control of the Contractor and that the CPM schedule cannot be revised to eliminate the need for the requested time extension.”

Add the following new paragraphs after paragraph 4.05G of the General Conditions:

“4.06 Liquidated Damages:

- A. If the Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this Contract, to pay to the Owner the amount specified in the Contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contract shall be in default after the time stipulated in the Contract for completing the work. Such damages may be retained from time to time by the Owner from progress payments or any amounts owing to the Contractor, or otherwise collected.
- B. The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.
- C. It is further agreed that time is of the essence of each and every portion of this Contract and of the specifications wherein as definite and certain length of times if fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this Contract. Provided that the Contractor shall not be charged with liquidated damages of any excess cost when the Owner determines that the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Owner; Provided, further, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:
- 1) to any preference, priority or allocation order duly issued by the Government;
  - 2) to unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the

Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and severe weather; and

- 3) to any delays of subcontractors or suppliers occasioned by any of the causes specified in subsections C (1) and C (2) above;

D. Provided, further, that the Contractor shall, within thirty (30) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the Contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter."

## ARTICLE 5. AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

### SC-5.03

Delete the term "Supplementary Conditions" of paragraph 5.03A of the General Conditions and replace it with "Contract Documents".

Delete the term "Supplementary Conditions" of paragraph 5.03B line 2 of the General Conditions and replace it with "Contract Documents".

### SC-5.05

Delete the following words from lines 3 and 4 of paragraph 5.05 E.1 of the General Conditions:

"...or was not shown or indicated with reasonable accuracy"

### SC-5.06

Delete the term Supplementary Conditions in paragraph 5.06A of the General Conditions and replace it with "Contract Documents".

Add the following to the first sentence of paragraph 5.06C:

"or unless Contractor caused or contributed to such Hazardous Environmental Condition."

## ARTICLE 6. BONDS AND INSURANCE

### NOTICE TO CONTRACTOR:

1. Proof of Insurance coverage shall be furnished to the Owner in accordance with the schedule for submittal of Bonds and Agreements.
2. Additionally, refer to Article 2. PRELIMINARY MATTERS, Paragraph SC-2.01 B of the General Conditions.

#### SC-6.01

Insert these sentences following SC-6.01.A of the General Conditions: The Surety Company providing the bonds shall have a rating of A or better within the Best Key Rating Guide and be licensed by the Massachusetts Division of Insurance. The CONTRACTOR shall pay the premiums for such Bonds.

#### SC-6.02

Delete paragraph 6.02D of the General Conditions in its entirety if Owner is not providing insurance policies, coverages or endorsements for the Work.

#### SC-6.03

Add the following to paragraph 6.03C:

“9. Independent Contractors Coverage.”

The limits of liability for the insurance required by paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by law:

##### 6.03A Workers' Compensation.

(1)	Worker's Compensation per	Statutory Requirements
(2)	Coverage B - Employer's Liability	\$100,000/\$500,000/\$100,000

6.03B and 6.03C Commercial General Liability Limits shall include coverage for Independent Contractors, explosion, collapse and underground hazard coverage (XCU), broad form property damage, blanket contractual liability and products/completed operations. The general aggregate limits shall be endorsed so that they respond on a per project and per location basis.

Limits:

\$1,000,000 each occurrence

\$2,000,000 general aggregate

\$2,000,000 products/completed operations aggregate

6.03D Automobile Liability for owned, hired and non-owned vehicles:

\$1,000,000 Bodily Injury and Property Damage combined single limit

6.03E Umbrella or Excess Liability

Combined single limit of not less than \$5,000,000 per occurrence and in the aggregate

#### 6.03F Contractor's Pollution Liability

\$2,000,000 each occurrence and \$2,000,000 in the aggregate

#### 6.03H Contractor's Professional Liability

\$1,000,000 per claim and \$1,000,000 in the aggregate

Delete paragraph 6.03.I.3 of the General Conditions in its entirety and insert the following in its place:

- “3. contain a provision that notice of cancellation of insurance be delivered in accordance with policy provisions. In addition, the Contractor and/or its insurance broker/agent shall immediately notify the Owner and Engineer should any insurance coverage be cancelled. The Contractor shall immediately stop work on the Project and shall not resume work until the Contractor provides evidence, to the Owner and Engineer, in the form of an acceptable insurance certificate, of new insurance coverage that replaces all cancelled coverage that is required for the Project.”

Add the following paragraphs to SC-6.03I of the General Conditions:

- “6. If the aggregate limits of liability indicated in Contractor's insurance provided in accordance with paragraph 6.03 are not sufficient to cover all claims for damages arising from its operations under this Contract and from any other work performed by it or if the commercial general liability insurance policy of insurance does not provide that the general aggregate limits apply on a per project and per location basis, Contractor shall have the policy amended so that the aggregate limits of liability required by this Contract will be available to cover all claims for damages due to operations under this Contract.
7. Include by endorsement that the insurer shall waive all rights of subrogation in favor of the Owner, Engineer and any other party named in the written contract against whom the insurer must agree to waive rights of subrogation.”

#### SC-6.04

Delete paragraph 6.04 of the General Conditions in its entirety.

#### SC-6.05

Delete Article 6.05 of the General Conditions in its entirety.

#### SC-6.06

Amend the last sentence of paragraph 6.06A of the General Conditions by striking out the words "held by Owner or Contractor as trustee or fiduciary, or." As so amended, paragraph 6.06A remains in effect.

#### SC-6.08

Add the following paragraph 6.08 after paragraph 6.07 of the General Conditions:

"A. If Owner has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by Contractor in accordance with this Article 6 on the basis of its not complying with the Contract Documents, Owner will notify Contractor in writing thereof within thirty days of the date of delivery of such certificates to Owner in accordance with paragraph 6.02C. Contractor will provide such additional information in respect of insurance provided by him as Owner may reasonably request."

#### ARTICLE 7. CONTRACTOR'S RESPONSIBILITIES

#### SC-7.01

Delete paragraph 7.01B of the General Conditions in its entirety and replace with the following:

"B. At the site of the Work the Contractor shall employ a full-time construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Engineer and shall be one who will be continued in the capacity for the particular job involved unless the representative ceases to be on the Contractor's payroll. If at any time during the Work the representative is deemed by the Engineer to be no longer acceptable, the representative shall be promptly replaced by the Contractor. All communications to the superintendent or foreman shall be as binding as if given to the Contractor."

#### SC-7.07

Delete the second sentence in paragraph 7.07A of the General Conditions.

#### SC-7.12

In line 2 of paragraph 7.12C of the General Conditions change "Supplementary Conditions" to "Contract Documents".

#### SC-7.13

Delete the text in parentheses at the end of the third sentence of paragraph 7.13B of the General Conditions.

#### SC-7.16

In paragraph 7.16D.1 of the General Conditions, delete the word "timely" from the first line.

#### SC-7.18

Change the phrase "negligent act or omission" to "negligent or wrongful act or omission" in line 11 of paragraph 7.18A of the General Conditions.

Add the following to the end of paragraph 7.18A of the General Conditions:

“The Contractor hereby acknowledges its obligation under the foregoing paragraph to indemnify the Engineer and Owner against judgments suffered because of the contractor's work and to assume the cost of defending the Engineer and Owner against claims as described in the foregoing paragraph.”

Delete paragraph 7.18C of the General Conditions in its entirety.

## ARTICLE 9. OWNER'S RESPONSIBILITIES

### SC-9.02

Delete the phrase “provided Contractor makes no reasonable objection to the replacement engineer” in paragraph 9.02A of the General Conditions.

### SC-9.06

Delete paragraph 9.06A of the General Conditions in its entirety.

### SC-9.09

Insert the following after the first sentence of paragraph 9.09A of the General Conditions:

“However, the Owner shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto.”

## ARTICLE 10. ENGINEER'S STATUS DURING CONSTRUCTION

### SC-10.01

Add a new paragraph 10.01B after paragraph 10.01A of the General Conditions, which is to read as follows:

"B. Nothing contained in the Contract Documents shall be construed to create a contractual relationship of any kind (1) between the Engineer and Contractor, (2) between the Owner and a Subcontractor or Subcontractors, or (3) between any person or entities other than the Owner and Contractor. The Engineer shall, however, be entitled to performance and enforcement of obligations under the Contract Documents intended to facilitate performance of the Engineer's duties."

### SC-10.02

Insert the following at the end of paragraph 10.02B of the General Conditions:

“However, the Engineer shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto.”

SC-10.03

Delete the last sentence of paragraph 10.03A.

SC-10.08

Insert the following after the first sentence of paragraph 10.08B of the General Conditions:

“However, the Engineer shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto.”

#### ARTICLE 13. COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

Delete Article 13 of the General Conditions in its entirety and replace with the following:

"A. The unit price of an item of Unit Price work shall be subject to reevaluation and adjustment under the following conditions:

- (1) If the total extended bid price [Estimated Quantity times the Bid Unit Price] of a particular item of Unit Price Work amounts to 5 percent or more of the Original Contract Price and the variation in the quantity of the particular item of Unit Price Work performed by Contractor differs by more than 15 percent from the estimated quantity of such item indicated in the Agreement; and
- (2) If there is no corresponding adjustment with respect to any other item of work; and
- (3) If Contractor believes that Contractor has incurred additional expense as a result thereof, Contractor may make a claim for an adjustment in the Contract Price in accordance with Article 12 if the parties are unable to agree as to the effect of any such variations in the quantity of Unit Price Work performed. If Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, Owner shall be entitled to an adjustment in the unit price in an amount determined by the Engineer. Engineer shall not be liable in connection with any determination relating to adjustments which is rendered in good faith."

#### ARTICLE 14. TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

SC-14.03

Delete the word “Prompt” at the beginning of paragraph 14.03C of the General Conditions.

SC-14.07

Revise paragraph 14.07A of the General Conditions as follows:

- A. Delete the word “seven” and replace it with the word “ten” so that it reads “after ten days’ written notice to Contractor.”



ARTICLE 15. PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC-15.01

Delete paragraph 15.01B.3 of the General Conditions and insert the following in its place:

- "3. Retainage with respect to progress payments will be five percent or, if stipulated, the maximum allowed by law."

Delete the word "immediate" from subparagraph 15.01E.2 of the General Conditions.

Delete subparagraph 15.01E.3 of the General Conditions in its entirety.

SC-15.02

Delete paragraph 15.02A in its entirety and insert the following in its place:

- "A. Contractor warrants and guarantees that title to all work, material and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than at the time of Application for Payment free and clear of all liens. Contractor shall provide written transfer of title and a certified paid invoice provided by the supplier."

SC-15.03

Delete the third sentence of paragraph 15.03C of the General conditions and replace it with the following:

"Owner shall review the preliminary certificate and make written objection to Engineer as to any provisions of the certificate or attached punch list."

In the same paragraph, delete the phrase "within 14 days after submission of the preliminary certificate to Owner" in the fourth sentence; delete the phrase "within said 14 days" in the fifth sentence.

SC-15.06

Delete from paragraph 15.06B.1 of the General Conditions the phrase "within 10 days after receipt of the final Application for Payment," in the first sentence.

SC-15.08

Delete paragraph 15.08A of the General Conditions and insert the following in its place:

- "A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any work is found to be defective, Contractor shall promptly, without cost to Owner and in

accordance with Owner's written instructions: (i) correct such defective work, or, if it has been rejected by Owner, remove it from the site and replace it with work that is not defective, and (ii) satisfactorily correct or remove and replace any damage to other work or the work of others therefrom. If Contractor does not begin the repairs within ten (10) days of receipt of written notification and promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk, loss or damage, Owner may have the defective work corrected or the rejected work removed and replaced, and all claims, costs, losses and damages caused by or resulting from such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor."

## ARTICLE 16. SUSPENSION OF WORK AND TERMINATION

### SC-16.02

Add a new paragraph immediately after paragraph 16.02 A.4 of the General Conditions which is to read as follows:

"5. If the Work to be done under this Contract shall be abandoned, or if this Contract or any part thereof shall be sublet, without the previous written consent of Owner, or if the contract or any claim thereunder shall be assigned by Contractor otherwise than as herein specified."

## ARTICLE 18. MISCELLANEOUS

### SC-18.09, 18.10, 18.11, 18.12, 18.13

Add the following new paragraphs after paragraph 18.08 of the General Conditions:

"18.09 Assignment:

A. The Contractor shall not assign the whole or any part of this Contract or any moneys due or to become due hereunder until thirty (30) days prior notice in writing has been given to the Owner of the intention to assign, which notice shall state the identity and address of the prospective assignee. No assignment shall be made without the Owner's prior written consent. Such consent shall not be unreasonably withheld. In case the Contractor assigns all or any part of the moneys due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the work called for in this Contract.

### 18.10 Liability

It is understood and agreed that members of the Owner or any agent or employees of the Owner signing this Agreement shall not be personally liable hereunder for any action incurred in connection with this Agreement.

#### 18.11 State Statutes and Regulations

See Section 00830 of these Specifications for further modifications of the General Conditions due to state statutes and regulations.

#### 18.12 Severability

If any provision of this Agreement shall be invalid or unenforceable to any extent or in any application, then the remainder of this Agreement and of such terms and conditions, except to such extent or in such application, shall not be affected thereby, and each and every term and condition of this Agreement shall be valid and enforced to the fullest extent and in the broadest application permitted by law."

END OF SECTION

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SECTION 00830

STATE STATUTES AND REGULATIONS  
COMMONWEALTH OF MASSACHUSETTS

A. REVISIONS TO GENERAL CONDITIONS

1. Definitions
2. Subsurface Conditions Found Different
3. Proprietary Specifications
4. Substitutions and "Or Equals" – Contractor's Expense
5. Subcontracting
6. Permits
7. Massachusetts Sales and Use Tax
8. Contractor Records
9. Engineer's Decisions on Requirements of Contract Documents and Acceptability of Work
10. Change of Contract Price
11. Payments
12. Suspension of Work and Termination
13. Special Requirements for Hazardous Wastes Contracts
14. Labor Classifications and Prevailing Wage Rates
15. Contractor's Surety

B. OTHER REGULATORY REQUIREMENTS

1. Working Hours
2. DEP Community Sound Level Criteria
3. OSHA 10 Hour Certification Requirements

ATTACHMENT A

Prevailing Wage Rates

ATTACHMENT B

Excerpts from Chapter 149, Chapter 30 and Chapter 82 of the Massachusetts General Law

ATTACHMENT C

Minority and Women Business Enterprises

ATTACHMENT D

Change Orders

A. REVISIONS TO GENERAL CONDITIONS:

1. Definitions

The term "Awarding Authority," as used herein, shall be considered to be synonymous with the term "Owner," described in definition 1.01 A.28.

Delete definition 1.01 A.40 entitled "Substantial Completion" in the General Conditions in its entirety and insert the following in its place:

"Substantial Completion shall be interpreted in accordance with Massachusetts General Law (MGL) c. 30, §39G or 39K as appropriate."

2. Subsurface Conditions Found Different

Add the following sentence to the end of paragraph 5.04A of the General Conditions:

"...to do so. Adjustments resulting from subsurface or latent physical conditions will be in accordance with MGL c. 30, §39N."

3. Proprietary Specifications

Revise the third sentence of Paragraph 7.04A of the General Conditions to read as follows:

"Unless the specification indicates that a proprietary item is called for, other items of material or equipment of other suppliers may be submitted to Engineer for review under the circumstances described below, and in accordance with MGL c. 30, §39M."

4. Substitutions and "Or Equals" – Contractor's Expense

Insert the following at the beginning of Paragraphs 7.04B and 7.05E of the General Conditions:

"Except as required by and indicated in the specifications and contract documents pursuant to MGL c. 149, §44F,".

5. Subcontracting

Add the following language at the end of paragraph 7.06L of the General Conditions:

"Except as required otherwise by MGL c. 149, §44F, for Work governed by MGL c. 149, §44A through 44H."

6. Permits

Delete paragraph 7.08A of the General Conditions in its entirety and insert the following in its place:

"A. Unless otherwise provided for in Section 00890 PERMITS, the Awarding Authority shall be responsible for identifying and obtaining all federal, state, and local permits required by the nature and location of construction, including but not limited to railroad permits, building construction permits, and permits for street and highway cuts and openings. Contractor shall be responsible for obtaining all permits required of its equipment, work force, or particular operations (such as blasting) in the performance of the Work and not otherwise specified to be obtained by the Awarding Authority. These permit fees shall be paid by Contractor. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of bids, or, if there are no Bids, on the Effective Date of the Agreement."

7. Massachusetts Sales and Use Tax

Add the following paragraph after paragraph 7.09A of the General Conditions:

"B. The materials and supplies to be used by the Contractor in the Work of this Contract are exempt from the Sales and Use Tax of the Commonwealth of Massachusetts. The Awarding Authority tax exemption certificate number will be furnished to the Contractor."

8. Contractor Records

Add a new paragraph immediately after paragraph 7.10C of the General Conditions, which is to read as follows:

"D. The Contractor shall comply with all applicable provisions Chapter 30, Section 39R of the Massachusetts General Laws regarding, Contractor's records."

9. Engineer's Decisions on Requirements of Contract Documents and Acceptability of Work

Add the following language at the end of paragraph 10.07A of the General Conditions:

"The Engineer's interpretation will be made in accordance with the requirements of MGL c. 30, §39P."

10. Change of Contract Price

Delete paragraphs 11.04, 13.01, 13.02 and 13.03 of the General Conditions, having to do with Change of Contract Price. Changes in contract price will be governed by the section called "Change Orders," in Attachment D, Section 00830 and Article 13 in the Supplementary Conditions.

11. Payments

Add the following paragraph after Paragraph 15.01B.3 of the General Conditions:

"4. The Contractor shall submit Weekly Payroll Records Report and Statement of Compliance verifying compliance with the Minimum Prevailing Wage Law, MGL c. 149,

§26-27H. These Statements of Compliance shall be submitted as a condition of payment for work performed during the period the reports apply.”

Delete paragraph 15.01C.1 of the General Conditions in its entirety and insert the following in its place:

“1. Progress Payments will be made in accordance with MGLc. 30, Section §39G, or 39K, as applicable.”

Delete paragraph 15.01D.1 of the General Conditions in its entirety and replace it with the following:

“1. Payment shall be made in accordance with MGL c. 30, §39G.”

Add the following new paragraph following paragraph 15.01D.1 of the General Conditions:

“2. The Contractor shall make payments to Subcontractors in accordance with the requirements of MGL c. 30, §39F.”

Delete paragraph 15.06B.1 of the General Conditions in its entirety and insert the following in its place:

"1. If, on the basis of the Engineer's observation of the Work during construction and final inspection and, upon the Engineer's review of the final Application for Payment and accompanying documentation, the Engineer is satisfied that the Work has been completed and that the Contractor's other obligations under the Contract Documents have been fulfilled, the Engineer will indicate in writing its recommendation of payment and present the Application to the Awarding Authority for payment. Thereupon the Engineer will give written notice to the Awarding Authority and the Contractor that the Work is acceptable subject to the provisions of paragraph 15.07. Otherwise, the Engineer will return the Application to Contractor, indicating in writing the reasons for refusing to recommend final payment. In such case the Contractor shall make the necessary corrections and resubmit the Application. If the Application and accompanying documentation are appropriate as to form and substance, the Awarding Authority shall in accordance with the applicable provisions of the Massachusetts General Laws, make payment to the Contractor."

Delete paragraph 15.06D of the General Conditions in its entirety and replace it with the following:

“1. Payment shall be made in accordance with MGL c. 30, §39G.”

12. Suspension of Work and Termination

Delete paragraph 16.01A of the General Conditions in its entirety and insert the following in its place:

"A. The Awarding Authority may order, at any time and without cause, the Contractor to suspend or delay the Work in accordance with MGL c. 30, §39O."

13. Special Requirements for Hazardous Wastes Contracts

Add the following at the end of the first sentence of Paragraph 18.13 of the General Conditions:

“, and to the “Rules and Regulations for the Prevention of Accidents in Construction Operations Chapter 454 CMR (Code of Massachusetts Regulations) 10.00 et seq.”

14. Labor Classifications and Prevailing Wage Rates

Add the following paragraphs under the heading "Prevailing Wage Rates" after paragraph 18.13 of the Supplementary Conditions:

"18.14 Prevailing Wage Rates

- A. Prevailing Wage Rates as determined by the Director of the Executive Office of Labor and Workforce Development under the provisions of MGL c. 149, §26-27H apply to this project. A copy of the wage schedule is included in Attachment A of Section 00830. If, after the Notice of Award, it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rates as shall be determined by the Director. Such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation. The Contractor shall notify the Awarding Authority of its intention to employ persons in trades or occupations not classified in the wage determinations as soon as possible in order to allow sufficient time for the Awarding Authority to obtain approved rates for such trades or occupations.
- B. The schedule of wages referred to above are minimum rates only, and the Awarding Authority will not consider any claims for additional compensation made by Contractor because of payment by the Contractor of any wage rate in excess of the applicable rate contained in the Contract.
- C. The said schedule of wages shall continue to be the minimum rates to be paid during the life of this Agreement, except in the case of the duration of this Agreement exceeding one year, when the Contractor will be responsible for requesting and obtaining updated prevailing wage rates from the Owner before the one-year anniversary of the project's start date, and a legible copy of said schedule shall be kept posted in a conspicuous place at the site of the Work.



- D. Contractor and subcontractors shall submit a copy of weekly payroll records to the Awarding Authority and the Awarding Authority shall retain the records for a minimum of three years.”

15. Contractor’s Surety

Add the following sentences at the end of paragraph 6.01A:

“The Surety Company providing the bonds shall have a rating of A or better within the Best Key Rating Guide and be licensed by the Massachusetts Division of Insurance. The Contractor shall pay the premiums for such Bonds.”

B. OTHER REGULATORY REQUIREMENTS:

1. Working Hours

No laborer, workman, mechanic, foreman, or inspector, working within the Commonwealth, in the employ of the Contractor, subcontractor, or other person doing or contracting to do the whole or a part of the work contemplated by this contract, shall be required or permitted to work more than eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in cases of emergency.

2. DEP Community Sound Level Criteria

The Community Sound Level Criteria as established by the Commonwealth of Massachusetts' Department of Environmental Protection (DEP) must be conformed to prior to the Awarding Authority's acceptance of the structure. The following sound level criteria must be met at the construction site:

- A. The increase in the broadband noise level shall not be in excess of ten (10) dB(A) above ambient at the station boundary. The ambient level is defined as the A-weighted noise level that is exceeded ninety (90) percent of the time measured during the period in question.
- B. The primary noise source(s) shall not produce a puretone condition. Puretone is any given octave band center frequency that exceeds the two adjacent center frequencies by three (3) or more decibels.

3. OSHA 10 Hour Certification Requirements

All employees of the Contractor who work at the jobsite must have received OSHA 10 Hour safety training, and have proof, at the jobsite, of being certified by OSHA as having received the training. The Contractor must provide written proof (copy of OSHA card each employee is required to carry is preferred) of this certification for every employee with submission of the first certified payroll report for each employee.

END OF SECTION

SECTION 00830

ATTACHMENT A

PREVAILING WAGE RATES



CHARLES D. BAKER  
Governor

KARYN E. POLITO  
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT  
DEPARTMENT OF LABOR STANDARDS

**Prevailing Wage Rates**

**As determined by the Director under the provisions of the  
Massachusetts General Laws, Chapter 149, Sections 26 to 27H**

ROSALIN ACOSTA  
Secretary  
WILLIAM D MCKINNEY  
Director

**Awarding Authority:** Town of Arlington, Massachusetts  
**Contract Number:** **City/Town:** ARLINGTON  
**Description of Work:** Phase #10 Sanitary Sewer Work- The Town of Arlington, Mass will be repairing the sanitary sewer system in various locations. Work will consist of trenchless and open excavation repairs to reduce I/I.  
**Job Location:** Arlington, Massachusetts

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Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule from the Department of Labor Standards ("DLS") if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F "rental of equipment" contracts.
- Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Construction</b>						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$33.25	\$10.91	\$10.89	\$0.00	\$55.05
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$33.32	\$10.91	\$10.89	\$0.00	\$55.12
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$33.44	\$10.91	\$10.89	\$0.00	\$55.24
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2017	\$92.97	\$9.90	\$21.15	\$0.00	\$124.02
	08/01/2018	\$97.80	\$9.90	\$21.15	\$0.00	\$128.85
	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
	For apprentice rates see "Apprentice- PILE DRIVER"					
AIR TRACK OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2017	\$38.25	\$7.70	\$14.75	\$0.00	\$60.70
	06/01/2018	\$39.20	\$7.70	\$14.75	\$0.00	\$61.65
	12/01/2018	\$40.15	\$7.70	\$14.75	\$0.00	\$62.60
	06/01/2019	\$41.15	\$7.70	\$14.75	\$0.00	\$63.60
	12/01/2019	\$42.15	\$7.70	\$14.75	\$0.00	\$64.60
	06/01/2020	\$43.14	\$7.70	\$14.75	\$0.00	\$65.59
	12/01/2020	\$44.12	\$7.70	\$14.75	\$0.00	\$66.57
	06/01/2021	\$45.14	\$7.70	\$14.75	\$0.00	\$67.59
	12/01/2021	\$46.15	\$7.70	\$14.75	\$0.00	\$68.60
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT &amp; FROST INSULATORS LOCAL 6 (BOSTON)</i>	12/01/2017	\$35.90	\$11.50	\$7.10	\$0.00	\$54.50
	06/01/2018	\$36.90	\$11.50	\$7.10	\$0.00	\$55.50
	12/01/2018	\$37.90	\$11.50	\$7.10	\$0.00	\$56.50
	06/01/2019	\$38.90	\$11.50	\$7.10	\$0.00	\$57.50
	12/01/2019	\$39.90	\$11.50	\$7.10	\$0.00	\$58.50
	06/01/2020	\$40.90	\$11.50	\$7.10	\$0.00	\$59.50
	12/01/2020	\$41.90	\$11.50	\$7.10	\$0.00	\$60.50
ASPHALT RAKER <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 1</i>	12/01/2017	\$38.25	\$7.70	\$14.75	\$0.00	\$60.70
	06/01/2018	\$39.20	\$7.70	\$14.75	\$0.00	\$61.65
	12/01/2018	\$40.15	\$7.70	\$14.75	\$0.00	\$62.60
	06/01/2019	\$41.15	\$7.70	\$14.75	\$0.00	\$63.60
	12/01/2019	\$42.15	\$7.70	\$14.75	\$0.00	\$64.60
	06/01/2020	\$43.14	\$7.70	\$14.75	\$0.00	\$65.59
	12/01/2020	\$44.12	\$7.70	\$14.75	\$0.00	\$66.57
	06/01/2021	\$45.14	\$7.70	\$14.75	\$0.00	\$67.59
	12/01/2021	\$46.15	\$7.70	\$14.75	\$0.00	\$68.60
For apprentice rates see "Apprentice- LABORER"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2017	\$42.92	\$6.97	\$16.21	\$0.00	\$66.10

**Apprentice - BOILERMAKER - Local 29**

**Effective Date - 01/01/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$27.90	\$6.97	\$10.54	\$0.00	\$45.41
2	65	\$27.90	\$6.97	\$10.54	\$0.00	\$45.41
3	70	\$30.04	\$6.97	\$11.35	\$0.00	\$48.36
4	75	\$32.19	\$6.97	\$12.16	\$0.00	\$51.32
5	80	\$34.34	\$6.97	\$12.97	\$0.00	\$54.28
6	85	\$36.48	\$6.97	\$13.78	\$0.00	\$57.23
7	90	\$38.63	\$6.97	\$14.59	\$0.00	\$60.19
8	95	\$40.77	\$6.97	\$15.40	\$0.00	\$63.14

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) <i>BRICKLAYERS LOCAL 3 (BOSTON)</i>	02/01/2018	\$52.06	\$10.75	\$20.03	\$0.00	\$82.84
	08/01/2018	\$53.41	\$10.75	\$20.16	\$0.00	\$84.32
	02/01/2019	\$54.05	\$10.75	\$20.16	\$0.00	\$84.96
	08/01/2019	\$55.40	\$10.75	\$20.30	\$0.00	\$86.45
	02/01/2020	\$56.04	\$10.75	\$20.30	\$0.00	\$87.09
	08/01/2020	\$57.39	\$10.75	\$20.45	\$0.00	\$88.59
	02/01/2021	\$58.03	\$10.75	\$20.45	\$0.00	\$89.23
	08/01/2021	\$59.43	\$10.75	\$20.61	\$0.00	\$90.79
	02/01/2022	\$60.02	\$10.75	\$20.61	\$0.00	\$91.38

**Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Boston**

**Effective Date -** 02/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.03	\$10.75	\$20.03	\$0.00	\$56.81
2	60	\$31.24	\$10.75	\$20.03	\$0.00	\$62.02
3	70	\$36.44	\$10.75	\$20.03	\$0.00	\$67.22
4	80	\$41.65	\$10.75	\$20.03	\$0.00	\$72.43
5	90	\$46.85	\$10.75	\$20.03	\$0.00	\$77.63

**Effective Date -** 08/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.71	\$10.75	\$20.16	\$0.00	\$57.62
2	60	\$32.05	\$10.75	\$20.16	\$0.00	\$62.96
3	70	\$37.39	\$10.75	\$20.16	\$0.00	\$68.30
4	80	\$42.73	\$10.75	\$20.16	\$0.00	\$73.64
5	90	\$48.07	\$10.75	\$20.16	\$0.00	\$78.98

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

BULLDOZER/GRADER/SCRAPER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CAISSON & UNDERPINNING BOTTOM MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2017	\$38.60	\$7.70	\$14.95	\$0.00	\$61.25
	06/01/2018	\$39.55	\$7.70	\$14.95	\$0.00	\$62.20
	12/01/2018	\$40.50	\$7.70	\$14.95	\$0.00	\$63.15
	06/01/2019	\$41.50	\$7.70	\$14.95	\$0.00	\$64.15
	12/01/2019	\$42.50	\$7.70	\$14.95	\$0.00	\$65.15
	06/01/2020	\$43.49	\$7.70	\$14.95	\$0.00	\$66.14
	12/01/2020	\$44.47	\$7.70	\$14.95	\$0.00	\$67.12
	06/01/2021	\$45.49	\$7.70	\$14.95	\$0.00	\$68.14
	12/01/2021	\$46.50	\$7.70	\$14.95	\$0.00	\$69.15

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2017	\$37.45	\$7.70	\$14.95	\$0.00	\$60.10
	06/01/2018	\$38.40	\$7.70	\$14.95	\$0.00	\$61.05
	12/01/2018	\$39.35	\$7.70	\$14.95	\$0.00	\$62.00
	06/01/2019	\$40.35	\$7.70	\$14.95	\$0.00	\$63.00
	12/01/2019	\$41.35	\$7.70	\$14.95	\$0.00	\$64.00
	06/01/2020	\$42.34	\$7.70	\$14.95	\$0.00	\$64.99
	12/01/2020	\$43.32	\$7.70	\$14.95	\$0.00	\$65.97
	06/01/2021	\$44.34	\$7.70	\$14.95	\$0.00	\$66.99
	12/01/2021	\$45.35	\$7.70	\$14.95	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2017	\$37.45	\$7.70	\$14.95	\$0.00	\$60.10
	06/01/2018	\$38.40	\$7.70	\$14.95	\$0.00	\$61.05
	12/01/2018	\$39.35	\$7.70	\$14.95	\$0.00	\$62.00
	06/01/2019	\$40.35	\$7.70	\$14.95	\$0.00	\$63.00
	12/01/2019	\$41.35	\$7.70	\$14.95	\$0.00	\$64.00
	06/01/2020	\$42.34	\$7.70	\$14.95	\$0.00	\$64.99
	12/01/2020	\$43.32	\$7.70	\$14.95	\$0.00	\$65.97
	06/01/2021	\$44.34	\$7.70	\$14.95	\$0.00	\$66.99
	12/01/2021	\$45.35	\$7.70	\$14.95	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	09/01/2017	\$39.28	\$9.90	\$17.50	\$0.00	\$66.68
	03/01/2018	\$40.28	\$9.90	\$17.50	\$0.00	\$67.68
	09/01/2018	\$41.32	\$9.90	\$17.50	\$0.00	\$68.72
	03/01/2019	\$42.35	\$9.90	\$17.50	\$0.00	\$69.75

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - CARPENTER - Zone 2 Eastern MA**

**Effective Date - 09/01/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.64	\$9.90	\$1.73	\$0.00	\$31.27
2	60	\$23.57	\$9.90	\$1.73	\$0.00	\$35.20
3	70	\$27.50	\$9.90	\$12.31	\$0.00	\$49.71
4	75	\$29.46	\$9.90	\$12.31	\$0.00	\$51.67
5	80	\$31.42	\$9.90	\$14.04	\$0.00	\$55.36
6	80	\$31.42	\$9.90	\$14.04	\$0.00	\$55.36
7	90	\$35.35	\$9.90	\$15.77	\$0.00	\$61.02
8	90	\$35.35	\$9.90	\$15.77	\$0.00	\$61.02

**Effective Date - 03/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.14	\$9.90	\$1.73	\$0.00	\$31.77
2	60	\$24.17	\$9.90	\$1.73	\$0.00	\$35.80
3	70	\$28.20	\$9.90	\$12.31	\$0.00	\$50.41
4	75	\$30.21	\$9.90	\$12.31	\$0.00	\$52.42
5	80	\$32.22	\$9.90	\$14.04	\$0.00	\$56.16
6	80	\$32.22	\$9.90	\$14.04	\$0.00	\$56.16
7	90	\$36.25	\$9.90	\$15.77	\$0.00	\$61.92
8	90	\$36.25	\$9.90	\$15.77	\$0.00	\$61.92

**Notes:**

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80  
Step 1&2 \$29.31/ 3&4 \$34.90/ 5&6 \$51.44/ 7&8 \$57.09

**Apprentice to Journeyworker Ratio:1:5**

CARPENTER WOOD FRAME	10/01/2017	\$26.25	\$7.07	\$7.86	\$0.00	\$41.18
CARPENTERS -ZONE 2 (Wood Frame)	04/01/2018	\$26.67	\$7.07	\$7.86	\$0.00	\$41.60
	10/01/2018	\$27.09	\$7.07	\$7.86	\$0.00	\$42.02
	04/01/2019	\$27.52	\$7.07	\$7.86	\$0.00	\$42.45
	10/01/2019	\$27.95	\$7.07	\$7.86	\$0.00	\$42.88

As of 9/1/09 Carpentry work on wood-frame WEATHERIZATION projects shall be paid the WOOD FRAME CARPENTER rate.



**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - CARPENTER (Wood Frame) - Zone 2**
**Effective Date - 10/01/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$15.75	\$7.07	\$0.00	\$0.00	\$22.82
2	60	\$15.75	\$7.07	\$0.00	\$0.00	\$22.82
3	65	\$17.06	\$7.07	\$7.86	\$0.00	\$31.99
4	70	\$18.38	\$7.07	\$7.86	\$0.00	\$33.31
5	75	\$19.69	\$7.07	\$7.86	\$0.00	\$34.62
6	80	\$21.00	\$7.07	\$7.86	\$0.00	\$35.93
7	85	\$22.31	\$7.07	\$7.86	\$0.00	\$37.24
8	90	\$23.63	\$7.07	\$7.86	\$0.00	\$38.56

**Effective Date - 04/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$16.00	\$7.07	\$0.00	\$0.00	\$23.07
2	60	\$16.00	\$7.07	\$0.00	\$0.00	\$23.07
3	65	\$17.34	\$7.07	\$7.86	\$0.00	\$32.27
4	70	\$18.67	\$7.07	\$7.86	\$0.00	\$33.60
5	75	\$20.00	\$7.07	\$7.86	\$0.00	\$34.93
6	80	\$21.34	\$7.07	\$7.86	\$0.00	\$36.27
7	85	\$22.67	\$7.07	\$7.86	\$0.00	\$37.60
8	90	\$24.00	\$7.07	\$7.86	\$0.00	\$38.93

**Notes:**

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80  
Step 1&2 \$18.88/ 3&4 \$26.26/ 5&6 \$33.31/ 7&8 \$35.93

**Apprentice to Journeyworker Ratio:1:5**

CARPENTER WOOD FRAME (All Other Work) CARPENTERS -ZONE 2 (Wood Frame)	06/01/2016	\$25.32	\$9.80	\$16.82	\$0.00	\$51.94
CEMENT MASONRY/PLASTERING BRICKLAYERS LOCAL 3 (BOSTON)	01/01/2018	\$46.02	\$12.35	\$22.41	\$0.30	\$81.08
	07/01/2018	\$47.41	\$12.35	\$22.41	\$0.30	\$82.47
	01/01/2019	\$48.15	\$12.35	\$22.41	\$0.30	\$83.21
	07/01/2019	\$49.54	\$12.35	\$22.41	\$0.30	\$84.60
	01/01/2020	\$50.29	\$12.35	\$22.41	\$0.30	\$85.35

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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**Apprentice - CEMENT MASONRY/PLASTERING - Eastern Mass (Boston)**

**Effective Date -** 01/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.01	\$12.35	\$15.41	\$0.00	\$50.77
2	60	\$27.61	\$12.35	\$17.41	\$0.30	\$57.67
3	65	\$29.91	\$12.35	\$18.41	\$0.30	\$60.97
4	70	\$32.21	\$12.35	\$19.41	\$0.30	\$64.27
5	75	\$34.52	\$12.35	\$20.41	\$0.30	\$67.58
6	80	\$36.82	\$12.35	\$21.41	\$0.30	\$70.88
7	90	\$41.42	\$12.35	\$22.41	\$0.30	\$76.48

**Effective Date -** 07/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.71	\$12.35	\$15.41	\$0.00	\$51.47
2	60	\$28.45	\$12.35	\$17.41	\$0.30	\$58.51
3	65	\$30.82	\$12.35	\$18.41	\$0.30	\$61.88
4	70	\$33.19	\$12.35	\$19.41	\$0.30	\$65.25
5	75	\$35.56	\$12.35	\$20.41	\$0.30	\$68.62
6	80	\$37.93	\$12.35	\$21.41	\$0.30	\$71.99
7	90	\$42.67	\$12.35	\$22.41	\$0.30	\$77.73

**Notes:**

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

**Apprentice to Journeyworker Ratio:1:3**

CHAIN SAW OPERATOR	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
LABORERS - ZONE 1	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES	12/01/2017	\$47.63	\$10.50	\$15.50	\$0.00	\$73.63
OPERATING ENGINEERS LOCAL 4						
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR	12/01/2017	\$31.80	\$10.50	\$15.50	\$0.00	\$57.80
OPERATING ENGINEERS LOCAL 4						
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE)	01/01/2017	\$51.41	\$7.85	\$16.10	\$0.00	\$75.36
PAINTERS LOCAL 35 - ZONE 2						

**Apprentice - PAINTER Local 35 - BRIDGES/TANKS**

**Effective Date - 01/01/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.71	\$7.85	\$0.00	\$0.00	\$33.56
2	55	\$28.28	\$7.85	\$3.66	\$0.00	\$39.79
3	60	\$30.85	\$7.85	\$3.99	\$0.00	\$42.69
4	65	\$33.42	\$7.85	\$4.32	\$0.00	\$45.59
5	70	\$35.99	\$7.85	\$14.11	\$0.00	\$57.95
6	75	\$38.56	\$7.85	\$14.44	\$0.00	\$60.85
7	80	\$41.13	\$7.85	\$14.77	\$0.00	\$63.75
8	90	\$46.27	\$7.85	\$15.44	\$0.00	\$69.56

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

DEMO: ADZEMAN	12/01/2017	\$37.65	\$7.70	\$14.75	\$0.00	\$60.10
LABORERS - ZONE 1	06/01/2018	\$38.60	\$7.70	\$14.75	\$0.00	\$61.05
	12/01/2018	\$39.55	\$7.70	\$14.75	\$0.00	\$62.00
	06/01/2019	\$40.55	\$7.70	\$14.75	\$0.00	\$63.00
	12/01/2019	\$41.55	\$7.70	\$14.75	\$0.00	\$64.00

For apprentice rates see "Apprentice- LABORER"

DEMO: BACKHOE/LOADER/HAMMER OPERATOR	12/01/2017	\$38.65	\$7.70	\$14.75	\$0.00	\$61.10
LABORERS - ZONE 1	06/01/2018	\$39.60	\$7.70	\$14.75	\$0.00	\$62.05
	12/01/2018	\$40.55	\$7.70	\$14.75	\$0.00	\$63.00
	06/01/2019	\$41.55	\$7.70	\$14.75	\$0.00	\$64.00
	12/01/2019	\$42.55	\$7.70	\$14.75	\$0.00	\$65.00

For apprentice rates see "Apprentice- LABORER"

DEMO: BURNERS	12/01/2017	\$38.40	\$7.70	\$14.75	\$0.00	\$60.85
LABORERS - ZONE 1	06/01/2018	\$39.35	\$7.70	\$14.75	\$0.00	\$61.80
	12/01/2018	\$40.30	\$7.70	\$14.75	\$0.00	\$62.75
	06/01/2019	\$41.30	\$7.70	\$14.75	\$0.00	\$63.75
	12/01/2019	\$42.30	\$7.70	\$14.75	\$0.00	\$64.75

For apprentice rates see "Apprentice- LABORER"

DEMO: CONCRETE CUTTER/SAWYER	12/01/2017	\$38.65	\$7.70	\$14.75	\$0.00	\$61.10
LABORERS - ZONE 1	06/01/2018	\$39.60	\$7.70	\$14.75	\$0.00	\$62.05
	12/01/2018	\$40.55	\$7.70	\$14.75	\$0.00	\$63.00
	06/01/2019	\$41.55	\$7.70	\$14.75	\$0.00	\$64.00
	12/01/2019	\$42.55	\$7.70	\$14.75	\$0.00	\$65.00

For apprentice rates see "Apprentice- LABORER"

DEMO: JACKHAMMER OPERATOR	12/01/2017	\$38.40	\$7.70	\$14.75	\$0.00	\$60.85
LABORERS - ZONE 1	06/01/2018	\$39.35	\$7.70	\$14.75	\$0.00	\$61.80
	12/01/2018	\$40.30	\$7.70	\$14.75	\$0.00	\$62.75
	06/01/2019	\$41.30	\$7.70	\$14.75	\$0.00	\$63.75
	12/01/2019	\$42.30	\$7.70	\$14.75	\$0.00	\$64.75

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER	12/01/2017	\$37.65	\$7.70	\$14.75	\$0.00	\$60.10
LABORERS - ZONE 1	06/01/2018	\$38.60	\$7.70	\$14.75	\$0.00	\$61.05
	12/01/2018	\$39.55	\$7.70	\$14.75	\$0.00	\$62.00
	06/01/2019	\$40.55	\$7.70	\$14.75	\$0.00	\$63.00
	12/01/2019	\$41.55	\$7.70	\$14.75	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
OPERATING ENGINEERS LOCAL 4						
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER	08/01/2017	\$61.98	\$9.90	\$21.15	\$0.00	\$93.03
PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2018	\$65.20	\$9.90	\$21.15	\$0.00	\$96.25
	08/01/2019	\$68.52	\$9.90	\$21.15	\$0.00	\$99.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER	08/01/2017	\$44.27	\$9.90	\$21.15	\$0.00	\$75.32
PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2018	\$46.57	\$9.90	\$21.15	\$0.00	\$77.62
	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT)	08/01/2017	\$66.41	\$9.90	\$21.15	\$0.00	\$97.46
PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2018	\$69.86	\$9.90	\$21.15	\$0.00	\$100.91
	08/01/2019	\$73.41	\$9.90	\$21.15	\$0.00	\$104.46
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT)	08/01/2017	\$92.97	\$9.90	\$21.15	\$0.00	\$124.02
PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2018	\$97.80	\$9.90	\$21.15	\$0.00	\$128.85
	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction)	09/01/2017	\$49.28	\$13.00	\$17.48	\$0.00	\$79.76
ELECTRICIANS LOCAL 103	03/01/2018	\$50.15	\$13.00	\$17.85	\$0.00	\$81.00
	09/01/2018	\$51.34	\$13.00	\$17.89	\$0.00	\$82.23
	03/01/2019	\$52.53	\$13.00	\$17.93	\$0.00	\$83.46
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN	09/01/2017	\$49.28	\$13.00	\$17.48	\$0.00	\$79.76
ELECTRICIANS LOCAL 103	03/01/2018	\$50.15	\$13.00	\$17.85	\$0.00	\$81.00
	09/01/2018	\$51.34	\$13.00	\$17.89	\$0.00	\$82.23
	03/01/2019	\$52.53	\$13.00	\$17.93	\$0.00	\$83.46

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - ELECTRICIAN - Local 103**

**Effective Date - 09/01/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$19.71	\$13.00	\$0.59	\$0.00	\$33.30
2	40	\$19.71	\$13.00	\$0.59	\$0.00	\$33.30
3	45	\$22.18	\$13.00	\$13.39	\$0.00	\$48.57
4	45	\$22.18	\$13.00	\$13.39	\$0.00	\$48.57
5	50	\$24.64	\$13.00	\$13.76	\$0.00	\$51.40
6	55	\$27.10	\$13.00	\$14.12	\$0.00	\$54.22
7	60	\$29.57	\$13.00	\$14.50	\$0.00	\$57.07
8	65	\$32.03	\$13.00	\$14.87	\$0.00	\$59.90
9	70	\$34.50	\$13.00	\$15.25	\$0.00	\$62.75
10	75	\$36.96	\$13.00	\$15.62	\$0.00	\$65.58

**Effective Date - 03/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.06	\$13.00	\$0.60	\$0.00	\$33.66
2	40	\$20.06	\$13.00	\$0.60	\$0.00	\$33.66
3	45	\$22.57	\$13.00	\$13.61	\$0.00	\$49.18
4	45	\$22.57	\$13.00	\$13.61	\$0.00	\$49.18
5	50	\$25.08	\$13.00	\$13.99	\$0.00	\$52.07
6	55	\$27.58	\$13.00	\$14.38	\$0.00	\$54.96
7	60	\$30.09	\$13.00	\$14.76	\$0.00	\$57.85
8	65	\$32.60	\$13.00	\$15.15	\$0.00	\$60.75
9	70	\$35.11	\$13.00	\$15.53	\$0.00	\$63.64
10	75	\$37.61	\$13.00	\$15.93	\$0.00	\$66.54

**Notes: :**

App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

**Apprentice to Journeyworker Ratio:2:3\*\*\***

ELEVATOR CONSTRUCTOR	01/01/2017	\$55.86	\$15.28	\$15.71	\$0.00	\$86.85
ELEVATOR CONSTRUCTORS LOCAL 4						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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**Apprentice - ELEVATOR CONSTRUCTOR - Local 4**

**Effective Date - 01/01/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.93	\$15.28	\$0.00	\$0.00	\$43.21
2	55	\$30.72	\$15.28	\$15.71	\$0.00	\$61.71
3	65	\$36.31	\$15.28	\$15.71	\$0.00	\$67.30
4	70	\$39.10	\$15.28	\$15.71	\$0.00	\$70.09
5	80	\$44.69	\$15.28	\$15.71	\$0.00	\$75.68

**Notes:**

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

**Apprentice to Journeyworker Ratio:1:1**

ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 4</i>	01/01/2017	\$39.10	\$15.28	\$15.71	\$0.00	\$70.09
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2017	\$42.88	\$10.00	\$15.25	\$0.00	\$68.13
	05/01/2018	\$43.59	\$10.00	\$15.25	\$0.00	\$68.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2017	\$44.34	\$10.00	\$15.25	\$0.00	\$69.59
	05/01/2018	\$45.06	\$10.00	\$15.25	\$0.00	\$70.31
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2017	\$22.83	\$10.00	\$15.25	\$0.00	\$48.08
	05/01/2018	\$23.26	\$10.00	\$15.25	\$0.00	\$48.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	09/01/2017	\$49.28	\$13.00	\$17.48	\$0.00	\$79.76
	03/01/2018	\$50.15	\$13.00	\$17.85	\$0.00	\$81.00
	09/01/2018	\$51.34	\$13.00	\$17.89	\$0.00	\$82.23
	03/01/2019	\$52.53	\$13.00	\$17.93	\$0.00	\$83.46
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE <i>LOCAL 103</i> / COMMISSIONING <i>ELECTRICIANS</i>	09/01/2017	\$36.96	\$13.00	\$15.62	\$0.00	\$65.58
	03/01/2018	\$37.61	\$13.00	\$15.93	\$0.00	\$66.54
	09/01/2018	\$38.51	\$13.00	\$15.96	\$0.00	\$67.47
	03/01/2019	\$39.40	\$13.00	\$15.98	\$0.00	\$68.38
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$38.57	\$10.50	\$15.50	\$0.00	\$64.57
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER <i>LABORERS - ZONE 1</i>	12/01/2017	\$21.50	\$7.70	\$14.75	\$0.00	\$43.95
	06/01/2018	\$21.50	\$7.70	\$14.75	\$0.00	\$43.95
	12/01/2018	\$22.50	\$7.70	\$14.75	\$0.00	\$44.95
	06/01/2019	\$22.50	\$7.70	\$14.75	\$0.00	\$44.95
	12/01/2019	\$23.50	\$7.70	\$14.75	\$0.00	\$45.95
	06/01/2020	\$23.50	\$7.70	\$14.75	\$0.00	\$45.95
	12/01/2020	\$24.50	\$7.70	\$14.75	\$0.00	\$46.95
	06/01/2021	\$24.50	\$7.70	\$14.75	\$0.00	\$46.95
	12/01/2021	\$24.50	\$7.70	\$14.75	\$0.00	\$46.95
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE I</i>	03/01/2016	\$42.13	\$9.80	\$17.62	\$0.00	\$69.55

**Apprentice - FLOORCOVERER - Local 2168 Zone I**

**Effective Date -** 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.07	\$9.80	\$1.79	\$0.00	\$32.66
2	55	\$23.17	\$9.80	\$1.79	\$0.00	\$34.76
3	60	\$25.28	\$9.80	\$12.25	\$0.00	\$47.33
4	65	\$27.38	\$9.80	\$12.25	\$0.00	\$49.43
5	70	\$29.49	\$9.80	\$14.04	\$0.00	\$53.33
6	75	\$31.60	\$9.80	\$14.04	\$0.00	\$55.44
7	80	\$33.70	\$9.80	\$15.83	\$0.00	\$59.33
8	85	\$35.81	\$9.80	\$15.83	\$0.00	\$61.44

**Notes:** Steps are 750 hrs.  
% After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)  
Step 1&2 \$30.55/ 3&4 \$36.49/ 5&6 \$53.33/ 7&8 \$59.33

**Apprentice to Journeyworker Ratio:1:1**

FORK LIFT/CHERRY PICKER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$31.80	\$10.50	\$15.50	\$0.00	\$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	01/01/2017	\$40.91	\$7.85	\$16.10	\$0.00	\$64.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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**Apprentice - GLAZIER - Local 35 Zone 2**

**Effective Date -** 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.46	\$7.85	\$0.00	\$0.00	\$28.31
2	55	\$22.50	\$7.85	\$3.66	\$0.00	\$34.01
3	60	\$24.55	\$7.85	\$3.99	\$0.00	\$36.39
4	65	\$26.59	\$7.85	\$4.32	\$0.00	\$38.76
5	70	\$28.64	\$7.85	\$14.11	\$0.00	\$50.60
6	75	\$30.68	\$7.85	\$14.44	\$0.00	\$52.97
7	80	\$32.73	\$7.85	\$14.77	\$0.00	\$55.35
8	90	\$36.82	\$7.85	\$15.44	\$0.00	\$60.11

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

HOISTING ENGINEER/CRANES/GRADALLS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
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**Apprentice - OPERATING ENGINEERS - Local 4**

**Effective Date -** 12/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$25.65	\$10.50	\$0.00	\$0.00	\$36.15
2	60	\$27.98	\$10.50	\$15.50	\$0.00	\$53.98
3	65	\$30.31	\$10.50	\$15.50	\$0.00	\$56.31
4	70	\$32.64	\$10.50	\$15.50	\$0.00	\$58.64
5	75	\$34.97	\$10.50	\$15.50	\$0.00	\$60.97
6	80	\$37.30	\$10.50	\$15.50	\$0.00	\$63.30
7	85	\$39.64	\$10.50	\$15.50	\$0.00	\$65.64
8	90	\$41.97	\$10.50	\$15.50	\$0.00	\$67.97

**Notes:**

**Apprentice to Journeyworker Ratio:1:6**

HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2018	\$44.11	\$12.20	\$24.12	\$2.41	\$82.84
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For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 103</i>	09/01/2017	\$49.28	\$13.00	\$17.48	\$0.00	\$79.76
	03/01/2018	\$50.15	\$13.00	\$17.85	\$0.00	\$81.00
	09/01/2018	\$51.34	\$13.00	\$17.89	\$0.00	\$82.23
	03/01/2019	\$52.53	\$13.00	\$17.93	\$0.00	\$83.46

For apprentice rates see "Apprentice- ELECTRICIAN"

HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2018	\$44.11	\$12.20	\$24.12	\$2.41	\$82.84
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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PIPEFITTERS LOCAL 537</i>	03/01/2017	\$51.19	\$9.70	\$18.14	\$0.00	\$79.03
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PIPEFITTERS LOCAL 537</i>	03/01/2017	\$51.19	\$9.70	\$18.14	\$0.00	\$79.03
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS <i>LABORERS - ZONE 1</i>	12/01/2017	\$38.25	\$7.70	\$14.75	\$0.00	\$60.70
	06/01/2018	\$39.20	\$7.70	\$14.75	\$0.00	\$61.65
	12/01/2018	\$40.15	\$7.70	\$14.75	\$0.00	\$62.60
	06/01/2019	\$41.15	\$7.70	\$14.75	\$0.00	\$63.60
	12/01/2019	\$42.15	\$7.70	\$14.75	\$0.00	\$64.60
	06/01/2020	\$43.14	\$7.70	\$14.75	\$0.00	\$65.59
	12/01/2020	\$44.12	\$7.70	\$14.75	\$0.00	\$66.57
	06/01/2021	\$45.14	\$7.70	\$14.75	\$0.00	\$67.59
INSULATOR (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (BOSTON)</i>	12/01/2021	\$46.15	\$7.70	\$14.75	\$0.00	\$68.60
	For apprentice rates see "Apprentice- LABORER"					
	09/01/2017	\$47.09	\$11.75	\$14.20	\$0.00	\$73.04
	09/01/2018	\$49.34	\$11.75	\$14.20	\$0.00	\$75.29
	09/01/2019	\$51.84	\$11.75	\$14.20	\$0.00	\$77.79

**Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston**

**Effective Date -** 09/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.55	\$11.75	\$10.45	\$0.00	\$45.75
2	60	\$28.25	\$11.75	\$11.20	\$0.00	\$51.20
3	70	\$32.96	\$11.75	\$11.95	\$0.00	\$56.66
4	80	\$37.67	\$11.75	\$12.70	\$0.00	\$62.12

**Effective Date -** 09/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.67	\$11.75	\$10.45	\$0.00	\$46.87
2	60	\$29.60	\$11.75	\$11.20	\$0.00	\$52.55
3	70	\$34.54	\$11.75	\$11.95	\$0.00	\$58.24
4	80	\$39.47	\$11.75	\$12.70	\$0.00	\$63.92

**Notes:**

Steps are 1 year

**Apprentice to Journeyworker Ratio:1:4**

IRONWORKER/WELDER <i>IRONWORKERS LOCAL 7 (BOSTON AREA)</i>	03/16/2017	\$44.65	\$7.80	\$20.85	\$0.00	\$73.30
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**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - IRONWORKER - Local 7 Boston**

**Effective Date - 03/16/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$26.79	\$7.80	\$20.85	\$0.00	\$55.44
2	70	\$31.26	\$7.80	\$20.85	\$0.00	\$59.91
3	75	\$33.49	\$7.80	\$20.85	\$0.00	\$62.14
4	80	\$35.72	\$7.80	\$20.85	\$0.00	\$64.37
5	85	\$37.95	\$7.80	\$20.85	\$0.00	\$66.60
6	90	\$40.19	\$7.80	\$20.85	\$0.00	\$68.84

**Notes:**

\*\* Structural 1:6; Ornamental 1:4

**Apprentice to Journeyworker Ratio:\*\***

JACKHAMMER & PAVING BREAKER OPERATOR	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
LABORERS - ZONE 1	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
LABORER	12/01/2017	\$37.50	\$7.70	\$14.75	\$0.00	\$59.95
LABORERS - ZONE 1	06/01/2018	\$38.45	\$7.70	\$14.75	\$0.00	\$60.90
	12/01/2018	\$39.40	\$7.70	\$14.75	\$0.00	\$61.85
	06/01/2019	\$40.40	\$7.70	\$14.75	\$0.00	\$62.85
	12/01/2019	\$41.40	\$7.70	\$14.75	\$0.00	\$63.85
	06/01/2020	\$42.39	\$7.70	\$14.75	\$0.00	\$64.84
	12/01/2020	\$43.37	\$7.70	\$14.75	\$0.00	\$65.82
	06/01/2021	\$44.39	\$7.70	\$14.75	\$0.00	\$66.84
	12/01/2021	\$45.40	\$7.70	\$14.75	\$0.00	\$67.85

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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**Apprentice - LABORER - Zone 1**

**Effective Date - 12/01/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.50	\$7.70	\$14.75	\$0.00	\$44.95
2	70	\$26.25	\$7.70	\$14.75	\$0.00	\$48.70
3	80	\$30.00	\$7.70	\$14.75	\$0.00	\$52.45
4	90	\$33.75	\$7.70	\$14.75	\$0.00	\$56.20

**Effective Date - 06/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.07	\$7.70	\$14.75	\$0.00	\$45.52
2	70	\$26.92	\$7.70	\$14.75	\$0.00	\$49.37
3	80	\$30.76	\$7.70	\$14.75	\$0.00	\$53.21
4	90	\$34.61	\$7.70	\$14.75	\$0.00	\$57.06

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

LABORER: CARPENTER TENDER	12/01/2017	\$37.50	\$7.70	\$14.75	\$0.00	\$59.95
LABORERS - ZONE 1	06/01/2018	\$38.45	\$7.70	\$14.75	\$0.00	\$60.90
	12/01/2018	\$39.40	\$7.70	\$14.75	\$0.00	\$61.85
	06/01/2019	\$40.40	\$7.70	\$14.75	\$0.00	\$62.85
	12/01/2019	\$41.40	\$7.70	\$14.75	\$0.00	\$63.85
	06/01/2020	\$42.39	\$7.70	\$14.75	\$0.00	\$64.84
	12/01/2020	\$43.37	\$7.70	\$14.75	\$0.00	\$65.82
	06/01/2021	\$44.39	\$7.70	\$14.75	\$0.00	\$66.84
	12/01/2021	\$45.40	\$7.70	\$14.75	\$0.00	\$67.85

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER	12/01/2017	\$37.50	\$7.70	\$14.75	\$0.00	\$59.95
LABORERS - ZONE 1	06/01/2018	\$38.45	\$7.70	\$14.75	\$0.00	\$60.90
	12/01/2018	\$39.40	\$7.70	\$14.75	\$0.00	\$61.85
	06/01/2019	\$40.40	\$7.70	\$14.75	\$0.00	\$62.85
	12/01/2019	\$41.40	\$7.70	\$14.75	\$0.00	\$63.85
	06/01/2020	\$42.39	\$7.70	\$14.75	\$0.00	\$64.84
	12/01/2020	\$43.37	\$7.70	\$14.75	\$0.00	\$65.82
	06/01/2021	\$44.39	\$7.70	\$14.75	\$0.00	\$66.84
	12/01/2021	\$45.40	\$7.70	\$14.75	\$0.00	\$67.85

For apprentice rates see "Apprentice- LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER	12/01/2017	\$37.65	\$7.70	\$14.75	\$0.00	\$60.10
LABORERS - ZONE 1	06/01/2018	\$38.60	\$7.70	\$14.75	\$0.00	\$61.05
	12/01/2018	\$39.55	\$7.70	\$14.75	\$0.00	\$62.00
	06/01/2019	\$40.55	\$7.70	\$14.75	\$0.00	\$63.00
	12/01/2019	\$41.55	\$7.70	\$14.75	\$0.00	\$64.00

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MASON TENDER <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.50	\$7.70	\$14.75	\$0.00	\$59.95
	06/01/2018	\$38.45	\$7.70	\$14.75	\$0.00	\$60.90
	12/01/2018	\$39.40	\$7.70	\$14.75	\$0.00	\$61.85
	06/01/2019	\$40.40	\$7.70	\$14.75	\$0.00	\$62.85
	12/01/2019	\$41.40	\$7.70	\$14.75	\$0.00	\$63.85
	06/01/2020	\$42.39	\$7.70	\$14.75	\$0.00	\$64.84
	12/01/2020	\$43.37	\$7.70	\$14.75	\$0.00	\$65.82
	06/01/2021	\$44.39	\$7.70	\$14.75	\$0.00	\$66.84
	12/01/2021	\$45.40	\$7.70	\$14.75	\$0.00	\$67.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.50	\$7.70	\$14.75	\$0.00	\$59.95
	06/01/2018	\$38.45	\$7.70	\$14.75	\$0.00	\$60.90
	12/01/2018	\$39.40	\$7.70	\$14.75	\$0.00	\$61.85
	06/01/2019	\$40.40	\$7.70	\$14.75	\$0.00	\$62.85
	12/01/2019	\$41.40	\$7.70	\$14.75	\$0.00	\$63.85
	06/01/2020	\$42.39	\$7.70	\$14.75	\$0.00	\$64.84
	12/01/2020	\$43.37	\$7.70	\$14.75	\$0.00	\$65.82
	06/01/2021	\$44.39	\$7.70	\$14.75	\$0.00	\$66.84
	12/01/2021	\$45.40	\$7.70	\$14.75	\$0.00	\$67.85
This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE &amp; TILE</i>	02/01/2018	\$39.82	\$10.75	\$18.34	\$0.00	\$68.91
	08/01/2018	\$40.90	\$10.75	\$18.47	\$0.00	\$70.12
	02/01/2019	\$41.41	\$10.75	\$18.47	\$0.00	\$70.63
	08/01/2019	\$42.49	\$10.75	\$18.61	\$0.00	\$71.85
	02/01/2020	\$43.00	\$10.75	\$18.61	\$0.00	\$72.36
	08/01/2020	\$44.08	\$10.75	\$18.76	\$0.00	\$73.59
	02/01/2021	\$44.59	\$10.75	\$18.76	\$0.00	\$74.10
	08/01/2021	\$45.71	\$10.75	\$18.92	\$0.00	\$75.38
	02/01/2022	\$46.18	\$10.75	\$18.92	\$0.00	\$75.85

**Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile**

**Effective Date -** 02/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.91	\$10.75	\$18.34	\$0.00	\$49.00
2	60	\$23.89	\$10.75	\$18.34	\$0.00	\$52.98
3	70	\$27.87	\$10.75	\$18.34	\$0.00	\$56.96
4	80	\$31.86	\$10.75	\$18.34	\$0.00	\$60.95
5	90	\$35.84	\$10.75	\$18.34	\$0.00	\$64.93

**Effective Date -** 08/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.45	\$10.75	\$18.47	\$0.00	\$49.67
2	60	\$24.54	\$10.75	\$18.47	\$0.00	\$53.76
3	70	\$28.63	\$10.75	\$18.47	\$0.00	\$57.85
4	80	\$32.72	\$10.75	\$18.47	\$0.00	\$61.94
5	90	\$36.81	\$10.75	\$18.47	\$0.00	\$66.03

**Notes:**

**Apprentice to Journeyworker Ratio:1:3**

MARBLE MASONS, TILELAYERS & TERRAZZO MECH <i>BRICKLAYERS LOCAL 3 - MARBLE &amp; TILE</i>	02/01/2018	\$52.10	\$10.75	\$20.03	\$0.00	\$82.88
	08/01/2018	\$53.45	\$10.75	\$20.16	\$0.00	\$84.36
	02/01/2019	\$54.07	\$10.75	\$20.16	\$0.00	\$84.98
	08/01/2019	\$55.42	\$10.75	\$20.30	\$0.00	\$86.47
	02/01/2020	\$56.05	\$10.75	\$20.30	\$0.00	\$87.10
	08/01/2020	\$57.40	\$10.75	\$20.45	\$0.00	\$88.60
	02/01/2021	\$58.04	\$10.75	\$20.45	\$0.00	\$89.24
	08/01/2021	\$59.44	\$10.75	\$20.61	\$0.00	\$90.80
	02/01/2022	\$60.01	\$10.75	\$20.61	\$0.00	\$91.37

**Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile**

**Effective Date -** 02/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.05	\$10.75	\$20.03	\$0.00	\$56.83
2	60	\$31.26	\$10.75	\$20.03	\$0.00	\$62.04
3	70	\$36.47	\$10.75	\$20.03	\$0.00	\$67.25
4	80	\$41.68	\$10.75	\$20.03	\$0.00	\$72.46
5	90	\$46.89	\$10.75	\$20.03	\$0.00	\$77.67

**Effective Date -** 08/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.73	\$10.75	\$20.16	\$0.00	\$57.64
2	60	\$32.07	\$10.75	\$20.16	\$0.00	\$62.98
3	70	\$37.42	\$10.75	\$20.16	\$0.00	\$68.33
4	80	\$42.76	\$10.75	\$20.16	\$0.00	\$73.67
5	90	\$48.11	\$10.75	\$20.16	\$0.00	\$79.02

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

MECH. SWEEPER OPERATOR (ON CONST. SITES) OPERATING ENGINEERS LOCAL 4	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE OPERATING ENGINEERS LOCAL 4	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 1) MILLWRIGHTS LOCAL 1121 - Zone 1	10/01/2017	\$39.52	\$9.90	\$18.50	\$0.00	\$67.92
	04/01/2018	\$40.42	\$9.90	\$18.50	\$0.00	\$68.82
	10/01/2018	\$41.32	\$9.90	\$18.50	\$0.00	\$69.72
	04/01/2019	\$42.22	\$9.90	\$18.50	\$0.00	\$70.62

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - MILLWRIGHT - Local 1121 Zone 1</b>						
<b>Effective Date - 10/01/2017</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$21.74	\$9.90	\$5.31	\$0.00	\$36.95
2	65	\$25.69	\$9.90	\$15.13	\$0.00	\$50.72
3	75	\$29.64	\$9.90	\$16.10	\$0.00	\$55.64
4	85	\$33.59	\$9.90	\$17.06	\$0.00	\$60.55
<b>Effective Date - 04/01/2018</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$22.23	\$9.90	\$5.31	\$0.00	\$37.44
2	65	\$26.27	\$9.90	\$15.13	\$0.00	\$51.30
3	75	\$30.32	\$9.90	\$16.10	\$0.00	\$56.32
4	85	\$34.36	\$9.90	\$17.06	\$0.00	\$61.32
<b>Notes:</b>						
Steps are 2,000 hours						
<b>Apprentice to Journeyworker Ratio:1:5</b>						
MORTAR MIXER	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
LABORERS - ZONE 1	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS)	12/01/2017	\$23.24	\$10.50	\$15.50	\$0.00	\$49.24
OPERATING ENGINEERS LOCAL 4	For apprentice rates see "Apprentice- OPERATING ENGINEERS"					
OILER (TRUCK CRANES, GRADALLS)	12/01/2017	\$27.40	\$10.50	\$15.50	\$0.00	\$53.40
OPERATING ENGINEERS LOCAL 4	For apprentice rates see "Apprentice- OPERATING ENGINEERS"					
OTHER POWER DRIVEN EQUIPMENT - CLASS II	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
OPERATING ENGINEERS LOCAL 4	For apprentice rates see "Apprentice- OPERATING ENGINEERS"					
PAINTER (BRIDGES/TANKS)	01/01/2017	\$51.41	\$7.85	\$16.10	\$0.00	\$75.36
PAINTERS LOCAL 35 - ZONE 2						

**Apprentice - PAINTER Local 35 - BRIDGES/TANKS****Effective Date -** 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.71	\$7.85	\$0.00	\$0.00	\$33.56
2	55	\$28.28	\$7.85	\$3.66	\$0.00	\$39.79
3	60	\$30.85	\$7.85	\$3.99	\$0.00	\$42.69
4	65	\$33.42	\$7.85	\$4.32	\$0.00	\$45.59
5	70	\$35.99	\$7.85	\$14.11	\$0.00	\$57.95
6	75	\$38.56	\$7.85	\$14.44	\$0.00	\$60.85
7	80	\$41.13	\$7.85	\$14.77	\$0.00	\$63.75
8	90	\$46.27	\$7.85	\$15.44	\$0.00	\$69.56

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER (SPRAY OR SANDBLAST, NEW) \*

01/01/2017

\$42.31

\$7.85

\$16.10

\$0.00

\$66.26

\* If 30% or more of surfaces to be painted are new construction,

NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2

**Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New****Effective Date -** 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.16	\$7.85	\$0.00	\$0.00	\$29.01
2	55	\$23.27	\$7.85	\$3.66	\$0.00	\$34.78
3	60	\$25.39	\$7.85	\$3.99	\$0.00	\$37.23
4	65	\$27.50	\$7.85	\$4.32	\$0.00	\$39.67
5	70	\$29.62	\$7.85	\$14.11	\$0.00	\$51.58
6	75	\$31.73	\$7.85	\$14.44	\$0.00	\$54.02
7	80	\$33.85	\$7.85	\$14.77	\$0.00	\$56.47
8	90	\$38.08	\$7.85	\$15.44	\$0.00	\$61.37

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER (SPRAY OR SANDBLAST, REPAINT)

01/01/2017

\$40.37

\$7.85

\$16.10

\$0.00

\$64.32

PAINTERS LOCAL 35 - ZONE 2



**Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint****Effective Date -** 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.19	\$7.85	\$0.00	\$0.00	\$28.04
2	55	\$22.20	\$7.85	\$3.66	\$0.00	\$33.71
3	60	\$24.22	\$7.85	\$3.99	\$0.00	\$36.06
4	65	\$26.24	\$7.85	\$4.32	\$0.00	\$38.41
5	70	\$28.26	\$7.85	\$14.11	\$0.00	\$50.22
6	75	\$30.28	\$7.85	\$14.44	\$0.00	\$52.57
7	80	\$32.30	\$7.85	\$14.77	\$0.00	\$54.92
8	90	\$36.33	\$7.85	\$15.44	\$0.00	\$59.62

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER (TRAFFIC MARKINGS)

LABORERS - ZONE 1

12/01/2017	\$37.50	\$7.70	\$14.75	\$0.00	\$59.95
06/01/2018	\$38.45	\$7.70	\$14.75	\$0.00	\$60.90
12/01/2018	\$39.40	\$7.70	\$14.75	\$0.00	\$61.85
06/01/2019	\$40.40	\$7.70	\$14.75	\$0.00	\$62.85
12/01/2019	\$41.40	\$7.70	\$14.75	\$0.00	\$63.85
06/01/2020	\$42.39	\$7.70	\$14.75	\$0.00	\$64.84
12/01/2020	\$43.37	\$7.70	\$14.75	\$0.00	\$65.82
06/01/2021	\$44.39	\$7.70	\$14.75	\$0.00	\$66.84
12/01/2021	\$45.40	\$7.70	\$14.75	\$0.00	\$67.85

For Apprentice rates see "Apprentice- LABORER"

PAINTER / TAPER (BRUSH, NEW) \*

\* If 30% or more of surfaces to be painted are new construction,  
NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2

01/01/2017	\$40.91	\$7.85	\$16.10	\$0.00	\$64.86
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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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**Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW**

**Effective Date -** 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.46	\$7.85	\$0.00	\$0.00	\$28.31
2	55	\$22.50	\$7.85	\$3.66	\$0.00	\$34.01
3	60	\$24.55	\$7.85	\$3.99	\$0.00	\$36.39
4	65	\$26.59	\$7.85	\$4.32	\$0.00	\$38.76
5	70	\$28.64	\$7.85	\$14.11	\$0.00	\$50.60
6	75	\$30.68	\$7.85	\$14.44	\$0.00	\$52.97
7	80	\$32.73	\$7.85	\$14.77	\$0.00	\$55.35
8	90	\$36.82	\$7.85	\$15.44	\$0.00	\$60.11

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2017	\$38.97	\$7.85	\$16.10	\$0.00	\$62.92
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PAINTERS LOCAL 35 - ZONE 2

**Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT**

**Effective Date -** 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.49	\$7.85	\$0.00	\$0.00	\$27.34
2	55	\$21.43	\$7.85	\$3.66	\$0.00	\$32.94
3	60	\$23.38	\$7.85	\$3.99	\$0.00	\$35.22
4	65	\$25.33	\$7.85	\$4.32	\$0.00	\$37.50
5	70	\$27.28	\$7.85	\$14.11	\$0.00	\$49.24
6	75	\$29.23	\$7.85	\$14.44	\$0.00	\$51.52
7	80	\$31.18	\$7.85	\$14.77	\$0.00	\$53.80
8	90	\$35.07	\$7.85	\$15.44	\$0.00	\$58.36

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PANEL & PICKUP TRUCKS DRIVER	12/01/2016	\$33.08	\$10.91	\$10.89	\$0.00	\$54.88
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TEAMSTERS JOINT COUNCIL NO. 10 ZONE A

PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)	08/01/2017	\$44.27	\$9.90	\$21.15	\$0.00	\$75.32
PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2018	\$46.57	\$9.90	\$21.15	\$0.00	\$77.62
	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99

For apprentice rates see "Apprentice- PILE DRIVER"

PILE DRIVER	08/01/2017	\$44.27	\$9.90	\$21.15	\$0.00	\$75.32
PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2018	\$46.57	\$9.90	\$21.15	\$0.00	\$77.62
	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99

**Classification**

Effective Date    Base Wage    Health    Pension    Supplemental  
Unemployment    Total Rate

**Apprentice - PILE DRIVER - Local 56 Zone 1**
**Effective Date - 08/01/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.14	\$9.90	\$21.15	\$0.00	\$53.19
2	60	\$26.56	\$9.90	\$21.15	\$0.00	\$57.61
3	70	\$30.99	\$9.90	\$21.15	\$0.00	\$62.04
4	75	\$33.20	\$9.90	\$21.15	\$0.00	\$64.25
5	80	\$35.42	\$9.90	\$21.15	\$0.00	\$66.47
6	80	\$35.42	\$9.90	\$21.15	\$0.00	\$66.47
7	90	\$39.84	\$9.90	\$21.15	\$0.00	\$70.89
8	90	\$39.84	\$9.90	\$21.15	\$0.00	\$70.89

**Effective Date - 08/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.29	\$9.90	\$21.15	\$0.00	\$54.34
2	60	\$27.94	\$9.90	\$21.15	\$0.00	\$58.99
3	70	\$32.60	\$9.90	\$21.15	\$0.00	\$63.65
4	75	\$34.93	\$9.90	\$21.15	\$0.00	\$65.98
5	80	\$37.26	\$9.90	\$21.15	\$0.00	\$68.31
6	80	\$37.26	\$9.90	\$21.15	\$0.00	\$68.31
7	90	\$41.91	\$9.90	\$21.15	\$0.00	\$72.96
8	90	\$41.91	\$9.90	\$21.15	\$0.00	\$72.96

**Notes:**
**Apprentice to Journeyworker Ratio:1:5**
**PIPEFITTER & STEAMFITTER**
**PIPEFITTERS LOCAL 537**

03/01/2017    \$51.19    \$9.70    \$18.14    \$0.00    \$79.03

**Apprentice - PIPEFITTER - Local 537**
**Effective Date - 03/01/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.48	\$9.70	\$7.50	\$0.00	\$37.68
2	45	\$23.04	\$9.70	\$18.14	\$0.00	\$50.88
3	60	\$30.71	\$9.70	\$18.14	\$0.00	\$58.55
4	70	\$35.83	\$9.70	\$18.14	\$0.00	\$63.67
5	80	\$40.95	\$9.70	\$18.14	\$0.00	\$68.79

**Notes:**

\*\* 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.

Refrig/AC Mechanic \*\*1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:17;9:20;10:23(Max)

**Apprentice to Journeyworker Ratio:\*\***

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

PLUMBERS & GASFITTERS <i>PLUMBERS &amp; GASFITTERS LOCAL 12</i>	09/01/2017	\$53.94	\$11.57	\$15.26	\$0.00	\$80.77
	03/01/2018	\$54.69	\$11.57	\$15.76	\$0.00	\$82.02
	09/01/2018	\$56.19	\$11.57	\$15.76	\$0.00	\$83.52
	03/01/2019	\$57.69	\$11.57	\$15.76	\$0.00	\$85.02
	09/01/2019	\$59.19	\$11.57	\$15.76	\$0.00	\$86.52
	03/01/2020	\$60.69	\$11.57	\$15.76	\$0.00	\$88.02
	09/01/2020	\$62.19	\$11.57	\$15.76	\$0.00	\$89.52
	03/01/2021	\$63.69	\$11.57	\$15.76	\$0.00	\$91.02

#### Apprentice - PLUMBER/GASFITTER - Local 12

Effective Date - 09/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$18.88	\$11.57	\$5.54	\$0.00	\$35.99
2	40	\$21.58	\$11.57	\$6.29	\$0.00	\$39.44
3	55	\$29.67	\$11.57	\$8.53	\$0.00	\$49.77
4	65	\$35.06	\$11.57	\$10.03	\$0.00	\$56.66
5	75	\$40.46	\$11.57	\$11.52	\$0.00	\$63.55

Effective Date - 03/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$19.14	\$11.57	\$5.72	\$0.00	\$36.43
2	40	\$21.88	\$11.57	\$6.49	\$0.00	\$39.94
3	55	\$30.08	\$11.57	\$8.81	\$0.00	\$50.46
4	65	\$35.55	\$11.57	\$10.36	\$0.00	\$57.48
5	75	\$41.02	\$11.57	\$11.90	\$0.00	\$64.49

#### Notes:

\*\* 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr  
Step4 with lic\$60.10 Step5 with lic\$66.99

Apprentice to Journeyworker Ratio:\*\*

PNEUMATIC CONTROLS (TEMP.) <i>PIPEFITTERS LOCAL 537</i>	03/01/2017	\$51.19	\$9.70	\$18.14	\$0.00	\$79.03
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For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER <i>LABORERS - ZONE 1</i>	12/01/2017	\$38.50	\$7.70	\$14.75	\$0.00	\$60.95
	06/01/2018	\$39.45	\$7.70	\$14.75	\$0.00	\$61.90
	12/01/2018	\$40.40	\$7.70	\$14.75	\$0.00	\$62.85
	06/01/2019	\$41.40	\$7.70	\$14.75	\$0.00	\$63.85
	12/01/2019	\$42.40	\$7.70	\$14.75	\$0.00	\$64.85
	06/01/2020	\$43.39	\$7.70	\$14.75	\$0.00	\$65.84
	12/01/2020	\$44.37	\$7.70	\$14.75	\$0.00	\$66.82
	06/01/2021	\$45.39	\$7.70	\$14.75	\$0.00	\$67.84
	12/01/2021	\$46.40	\$7.70	\$14.75	\$0.00	\$68.85
For apprentice rates see "Apprentice- LABORER"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$31.80	\$10.50	\$15.50	\$0.00	\$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY MIX CONCRETE DRIVERS after 4/30/10 (Drivers Hired After 4/30/2010) <i>TEAMSTERS LOCAL 25c</i>	07/01/2017	\$28.18	\$8.48	\$9.72	\$0.00	\$46.38
READY-MIX CONCRETE DRIVER <i>TEAMSTERS LOCAL 25c</i>	07/01/2017	\$29.48	\$8.48	\$9.72	\$0.00	\$47.68
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ROOFER (Inc.Roofing Waterproofing &Roofing Damproofg) <i>ROOFERS LOCAL 33</i>	02/01/2018	\$42.36	\$11.35	\$14.80	\$0.00	\$68.51
	08/01/2018	\$43.46	\$11.35	\$14.80	\$0.00	\$69.61
	02/01/2019	\$44.61	\$11.35	\$14.80	\$0.00	\$70.76

**Apprentice - ROOFER - Local 33**

**Effective Date -** 02/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.18	\$11.35	\$3.44	\$0.00	\$35.97
2	60	\$25.42	\$11.35	\$14.80	\$0.00	\$51.57
3	65	\$27.53	\$11.35	\$14.80	\$0.00	\$53.68
4	75	\$31.77	\$11.35	\$14.80	\$0.00	\$57.92
5	85	\$36.01	\$11.35	\$14.80	\$0.00	\$62.16

**Effective Date -** 08/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.73	\$11.35	\$3.44	\$0.00	\$36.52
2	60	\$26.08	\$11.35	\$14.80	\$0.00	\$52.23
3	65	\$28.25	\$11.35	\$14.80	\$0.00	\$54.40
4	75	\$32.60	\$11.35	\$14.80	\$0.00	\$58.75
5	85	\$36.94	\$11.35	\$14.80	\$0.00	\$63.09

**Notes:** \*\* 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1  
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.  
(Hot Pitch Mechanics' receive \$1.00 hr. above ROOFER)

**Apprentice to Journeyworker Ratio:\*\***

ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 33</i>	02/01/2018	\$42.61	\$11.35	\$14.80	\$0.00	\$68.76
	08/01/2018	\$43.71	\$11.35	\$14.80	\$0.00	\$69.86
	02/01/2019	\$44.86	\$11.35	\$14.80	\$0.00	\$71.01
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2018	\$44.11	\$12.20	\$24.12	\$2.41	\$82.84

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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**Apprentice - SHEET METAL WORKER - Local 17-A**

**Effective Date -** 02/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.64	\$12.20	\$5.61	\$0.00	\$35.45
2	40	\$17.64	\$12.20	\$5.61	\$0.00	\$35.45
3	45	\$19.85	\$12.20	\$10.85	\$1.29	\$44.19
4	45	\$19.85	\$12.20	\$10.85	\$1.29	\$44.19
5	50	\$22.06	\$12.20	\$11.80	\$1.38	\$47.44
6	50	\$22.06	\$12.20	\$12.05	\$1.39	\$47.70
7	60	\$26.47	\$12.20	\$13.70	\$1.57	\$53.94
8	65	\$28.67	\$12.20	\$14.65	\$1.67	\$57.19
9	75	\$33.08	\$12.20	\$16.56	\$1.86	\$63.70
10	85	\$37.49	\$12.20	\$17.96	\$2.03	\$69.68

**Notes:**

Steps are 6 mos.

**Apprentice to Journeyworker Ratio:1:4**

SIGN ERECTOR	06/01/2013	\$25.81	\$7.07	\$7.05	\$0.00	\$39.93
PAINTERS LOCAL 35 - ZONE 2						

**Apprentice - SIGN ERECTOR - Local 35 Zone 2**

**Effective Date -** 06/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$12.91	\$7.07	\$0.00	\$0.00	\$19.98
2	55	\$14.20	\$7.07	\$2.45	\$0.00	\$23.72
3	60	\$15.49	\$7.07	\$2.45	\$0.00	\$25.01
4	65	\$16.78	\$7.07	\$2.45	\$0.00	\$26.30
5	70	\$18.07	\$7.07	\$7.05	\$0.00	\$32.19
6	75	\$19.36	\$7.07	\$7.05	\$0.00	\$33.48
7	80	\$20.65	\$7.07	\$7.05	\$0.00	\$34.77
8	85	\$21.94	\$7.07	\$7.05	\$0.00	\$36.06
9	90	\$23.23	\$7.07	\$7.05	\$0.00	\$37.35

**Notes:**

Steps are 4 mos.

**Apprentice to Journeyworker Ratio:1:1**

SPECIALIZED EARTH MOVING EQUIP < 35 TONS	12/01/2016	\$33.54	\$10.91	\$10.89	\$0.00	\$55.34
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A						

SPECIALIZED EARTH MOVING EQUIP > 35 TONS	12/01/2016	\$33.83	\$10.91	\$10.89	\$0.00	\$55.63
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPRINKLER FITTER	01/01/2018	\$57.03	\$9.12	\$17.40	\$0.00	\$83.55
<i>SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1</i>	03/01/2018	\$58.53	\$9.12	\$17.40	\$0.00	\$85.05
	10/01/2018	\$60.03	\$9.12	\$17.40	\$0.00	\$86.55
	01/01/2019	\$60.03	\$9.47	\$17.60	\$0.00	\$87.10
	03/01/2019	\$61.53	\$9.47	\$17.60	\$0.00	\$88.60
	10/01/2019	\$63.03	\$9.47	\$17.60	\$0.00	\$90.10
	03/01/2020	\$64.53	\$9.47	\$17.60	\$0.00	\$91.60
	10/01/2020	\$66.03	\$9.47	\$17.60	\$0.00	\$93.10
	03/01/2021	\$67.53	\$9.47	\$17.60	\$0.00	\$94.60

**Apprentice - SPRINKLER FITTER - Local 550 (Section A) Zone 1**

**Effective Date -** 01/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$19.96	\$9.12	\$8.90	\$0.00	\$37.98
2	40	\$22.81	\$9.12	\$8.90	\$0.00	\$40.83
3	45	\$25.66	\$9.12	\$8.90	\$0.00	\$43.68
4	50	\$28.52	\$9.12	\$8.90	\$0.00	\$46.54
5	55	\$31.37	\$9.12	\$8.90	\$0.00	\$49.39
6	60	\$34.22	\$9.12	\$10.40	\$0.00	\$53.74
7	65	\$37.07	\$9.12	\$10.40	\$0.00	\$56.59
8	70	\$39.92	\$9.12	\$10.40	\$0.00	\$59.44
9	75	\$42.77	\$9.12	\$10.40	\$0.00	\$62.29
10	80	\$45.62	\$9.12	\$10.40	\$0.00	\$65.14

**Effective Date -** 03/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$20.49	\$9.12	\$8.90	\$0.00	\$38.51
2	40	\$23.41	\$9.12	\$8.90	\$0.00	\$41.43
3	45	\$26.34	\$9.12	\$8.90	\$0.00	\$44.36
4	50	\$29.27	\$9.12	\$8.90	\$0.00	\$47.29
5	55	\$32.19	\$9.12	\$8.90	\$0.00	\$50.21
6	60	\$35.12	\$9.12	\$10.40	\$0.00	\$54.64
7	65	\$38.04	\$9.12	\$10.40	\$0.00	\$57.56
8	70	\$40.97	\$9.12	\$10.40	\$0.00	\$60.49
9	75	\$43.90	\$9.12	\$10.40	\$0.00	\$63.42
10	80	\$46.82	\$9.12	\$10.40	\$0.00	\$66.34

**Notes:** Apprentice entered prior 9/30/10:  
40/45/50/55/60/65/70/75/80/85  
Steps are 850 hours

**Apprentice to Journeyworker Ratio:1:3**

STEAM BOILER OPERATOR	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
<i>OPERATING ENGINEERS LOCAL 4</i>						
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
<i>OPERATING ENGINEERS LOCAL 4</i>						



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN	09/01/2017	\$36.96	\$13.00	\$15.62	\$0.00	\$65.58
<i>ELECTRICIANS LOCAL 103</i>	03/01/2018	\$37.61	\$13.00	\$15.93	\$0.00	\$66.54
	09/01/2018	\$38.51	\$13.00	\$15.96	\$0.00	\$67.47
	03/01/2019	\$39.40	\$13.00	\$15.98	\$0.00	\$68.38

**Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103**

**Effective Date - 09/01/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$14.78	\$13.00	\$0.44	\$0.00	\$28.22
2	40	\$14.78	\$13.00	\$0.44	\$0.00	\$28.22
3	45	\$16.63	\$13.00	\$12.55	\$0.00	\$42.18
4	45	\$16.63	\$13.00	\$12.55	\$0.00	\$42.18
5	50	\$18.48	\$13.00	\$12.82	\$0.00	\$44.30
6	55	\$20.33	\$13.00	\$13.10	\$0.00	\$46.43
7	60	\$22.18	\$13.00	\$13.39	\$0.00	\$48.57
8	65	\$24.02	\$13.00	\$13.66	\$0.00	\$50.68
9	70	\$25.87	\$13.00	\$13.95	\$0.00	\$52.82
10	75	\$27.72	\$13.00	\$14.22	\$0.00	\$54.94

**Effective Date - 03/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$15.04	\$13.00	\$0.45	\$0.00	\$28.49
2	40	\$15.04	\$13.00	\$0.45	\$0.00	\$28.49
3	45	\$16.92	\$13.00	\$12.74	\$0.00	\$42.66
4	45	\$16.92	\$13.00	\$12.74	\$0.00	\$42.66
5	50	\$18.81	\$13.00	\$13.03	\$0.00	\$44.84
6	55	\$20.69	\$13.00	\$13.32	\$0.00	\$47.01
7	60	\$22.57	\$13.00	\$13.61	\$0.00	\$49.18
8	65	\$24.45	\$13.00	\$13.90	\$0.00	\$51.35
9	70	\$26.33	\$13.00	\$14.19	\$0.00	\$53.52
10	75	\$28.21	\$13.00	\$14.48	\$0.00	\$55.69

**Notes:**

**Apprentice to Journeyworker Ratio:1:1**

TERRAZZO FINISHERS	02/01/2018	\$51.00	\$10.75	\$20.03	\$0.00	\$81.78
<i>BRICKLAYERS LOCAL 3 - MARBLE &amp; TILE</i>	08/01/2018	\$52.35	\$10.75	\$20.16	\$0.00	\$83.26
	02/01/2019	\$52.99	\$10.75	\$20.16	\$0.00	\$83.90
	08/01/2019	\$54.34	\$10.75	\$20.30	\$0.00	\$85.39
	02/01/2020	\$54.98	\$10.75	\$20.30	\$0.00	\$86.03
	08/01/2020	\$56.33	\$10.75	\$20.45	\$0.00	\$87.53
	02/01/2021	\$56.97	\$10.75	\$20.45	\$0.00	\$88.17
	08/01/2021	\$58.37	\$10.75	\$20.61	\$0.00	\$89.73
	02/01/2022	\$58.96	\$10.75	\$20.61	\$0.00	\$90.32

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - TERRAZZO FINISHER - Local 3 Marble &amp; Tile</b>						
<b>Effective Date - 02/01/2018</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.50	\$10.75	\$20.03	\$0.00	\$56.28
2	60	\$30.60	\$10.75	\$20.03	\$0.00	\$61.38
3	70	\$35.70	\$10.75	\$20.03	\$0.00	\$66.48
4	80	\$40.80	\$10.75	\$20.03	\$0.00	\$71.58
5	90	\$45.90	\$10.75	\$20.03	\$0.00	\$76.68
<div>Notes:</div>						
<b>Apprentice to Journeyworker Ratio:1:3</b>						
TEST BORING DRILLER	12/01/2017	\$38.85	\$7.70	\$14.95	\$0.00	\$61.50
LABORERS - FOUNDATION AND MARINE	06/01/2018	\$39.80	\$7.70	\$14.95	\$0.00	\$62.45
	12/01/2018	\$40.75	\$7.70	\$14.95	\$0.00	\$63.40
	06/01/2019	\$41.75	\$7.70	\$14.95	\$0.00	\$64.40
	12/01/2019	\$42.75	\$7.70	\$14.95	\$0.00	\$65.40
	06/01/2020	\$43.74	\$7.70	\$14.95	\$0.00	\$66.39
	12/01/2020	\$44.72	\$7.70	\$14.95	\$0.00	\$67.37
	06/01/2021	\$45.74	\$7.70	\$14.95	\$0.00	\$68.39
	12/01/2021	\$46.75	\$7.70	\$14.95	\$0.00	\$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER	12/01/2017	\$37.57	\$7.70	\$14.95	\$0.00	\$60.22
LABORERS - FOUNDATION AND MARINE	06/01/2018	\$38.52	\$7.70	\$14.95	\$0.00	\$61.17
	12/01/2018	\$39.47	\$7.70	\$14.95	\$0.00	\$62.12
	06/01/2019	\$40.47	\$7.70	\$14.95	\$0.00	\$63.12
	12/01/2019	\$41.47	\$7.70	\$14.95	\$0.00	\$64.12
	06/01/2020	\$42.46	\$7.70	\$14.95	\$0.00	\$65.11
	12/01/2020	\$43.44	\$7.70	\$14.95	\$0.00	\$66.09
	06/01/2021	\$44.46	\$7.70	\$14.95	\$0.00	\$67.11
	12/01/2021	\$45.47	\$7.70	\$14.95	\$0.00	\$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER	12/01/2017	\$37.45	\$7.70	\$14.95	\$0.00	\$60.10
LABORERS - FOUNDATION AND MARINE	06/01/2018	\$38.40	\$7.70	\$14.95	\$0.00	\$61.05
	12/01/2018	\$39.35	\$7.70	\$14.95	\$0.00	\$62.00
	06/01/2019	\$40.35	\$7.70	\$14.95	\$0.00	\$63.00
	12/01/2019	\$41.35	\$7.70	\$14.95	\$0.00	\$64.00
	06/01/2020	\$42.34	\$7.70	\$14.95	\$0.00	\$64.99
	12/01/2020	\$43.32	\$7.70	\$14.95	\$0.00	\$65.97
	06/01/2021	\$44.34	\$7.70	\$14.95	\$0.00	\$66.99
	12/01/2021	\$45.35	\$7.70	\$14.95	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
OPERATING ENGINEERS LOCAL 4						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$34.12	\$10.91	\$10.89	\$0.00	\$55.92
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>						
	12/01/2017	\$49.73	\$7.70	\$15.35	\$0.00	\$72.78
	06/01/2018	\$50.68	\$7.70	\$15.35	\$0.00	\$73.73
	12/01/2018	\$51.63	\$7.70	\$15.35	\$0.00	\$74.68
	06/01/2019	\$52.63	\$7.70	\$15.35	\$0.00	\$75.68
	12/01/2019	\$53.63	\$7.70	\$15.35	\$0.00	\$76.68
	06/01/2020	\$54.62	\$7.70	\$15.35	\$0.00	\$77.67
	12/01/2020	\$55.60	\$7.70	\$15.35	\$0.00	\$78.65
	06/01/2021	\$56.62	\$7.70	\$15.35	\$0.00	\$79.67
	12/01/2021	\$57.63	\$7.70	\$15.35	\$0.00	\$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2017	\$51.73	\$7.70	\$15.35	\$0.00	\$74.78
	06/01/2018	\$52.68	\$7.70	\$15.35	\$0.00	\$75.73
	12/01/2018	\$53.63	\$7.70	\$15.35	\$0.00	\$76.68
	06/01/2019	\$54.63	\$7.70	\$15.35	\$0.00	\$77.68
	12/01/2019	\$55.63	\$7.70	\$15.35	\$0.00	\$78.68
	06/01/2020	\$56.62	\$7.70	\$15.35	\$0.00	\$79.67
	12/01/2020	\$57.60	\$7.70	\$15.35	\$0.00	\$80.65
	06/01/2021	\$58.62	\$7.70	\$15.35	\$0.00	\$81.67
	12/01/2021	\$59.63	\$7.70	\$15.35	\$0.00	\$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2017	\$41.80	\$7.70	\$15.35	\$0.00	\$64.85
	06/01/2018	\$42.75	\$7.70	\$15.35	\$0.00	\$65.80
	12/01/2018	\$43.70	\$7.70	\$15.35	\$0.00	\$66.75
	06/01/2019	\$44.70	\$7.70	\$15.35	\$0.00	\$67.75
	12/01/2019	\$45.70	\$7.70	\$15.35	\$0.00	\$68.75
	06/01/2020	\$46.69	\$7.70	\$15.35	\$0.00	\$69.74
	12/01/2020	\$47.67	\$7.70	\$15.35	\$0.00	\$70.72
	06/01/2021	\$48.69	\$7.70	\$15.35	\$0.00	\$71.74
	12/01/2021	\$49.70	\$7.70	\$15.35	\$0.00	\$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2017	\$43.80	\$7.70	\$15.35	\$0.00	\$66.85
	06/01/2018	\$44.75	\$7.70	\$15.35	\$0.00	\$67.80
	12/01/2018	\$45.70	\$7.70	\$15.35	\$0.00	\$68.75
	06/01/2019	\$46.70	\$7.70	\$15.35	\$0.00	\$69.75
	12/01/2019	\$47.70	\$7.70	\$15.35	\$0.00	\$70.75
	06/01/2020	\$48.69	\$7.70	\$15.35	\$0.00	\$71.74
	12/01/2020	\$49.67	\$7.70	\$15.35	\$0.00	\$72.72
	06/01/2021	\$50.69	\$7.70	\$15.35	\$0.00	\$73.74
	12/01/2021	\$51.70	\$7.70	\$15.35	\$0.00	\$74.75
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$33.54	\$10.91	\$10.89	\$0.00	\$55.34

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WAGON DRILL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2017	\$37.75	\$7.70	\$14.75	\$0.00	\$60.20
	06/01/2018	\$38.70	\$7.70	\$14.75	\$0.00	\$61.15
	12/01/2018	\$39.65	\$7.70	\$14.75	\$0.00	\$62.10
	06/01/2019	\$40.65	\$7.70	\$14.75	\$0.00	\$63.10
	12/01/2019	\$41.65	\$7.70	\$14.75	\$0.00	\$64.10
	06/01/2020	\$42.64	\$7.70	\$14.75	\$0.00	\$65.09
	12/01/2020	\$43.62	\$7.70	\$14.75	\$0.00	\$66.07
	06/01/2021	\$44.64	\$7.70	\$14.75	\$0.00	\$67.09
	12/01/2021	\$45.65	\$7.70	\$14.75	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS &amp; GASFITTERS LOCAL 12</i>	09/01/2017	\$53.94	\$11.57	\$15.26	\$0.00	\$80.77
	03/01/2018	\$54.69	\$11.57	\$15.76	\$0.00	\$82.02
	09/01/2018	\$56.19	\$11.57	\$15.76	\$0.00	\$83.52
	03/01/2019	\$57.69	\$11.57	\$15.76	\$0.00	\$85.02
	09/01/2019	\$59.19	\$11.57	\$15.76	\$0.00	\$86.52
	03/01/2020	\$60.69	\$11.57	\$15.76	\$0.00	\$88.02
	09/01/2020	\$62.19	\$11.57	\$15.76	\$0.00	\$89.52
	03/01/2021	\$63.69	\$11.57	\$15.76	\$0.00	\$91.02
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
<b>Outside Electrical - East</b>						
CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$27.14	\$7.75	\$1.81	\$0.00	\$36.70
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$38.45	\$7.75	\$9.53	\$0.00	\$55.73
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$31.66	\$7.75	\$9.44	\$0.00	\$48.85
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$24.88	\$7.75	\$1.75	\$0.00	\$34.38
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$38.45	\$7.75	\$13.61	\$0.00	\$59.81
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$33.92	\$7.75	\$10.21	\$0.00	\$51.88
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$24.88	\$7.75	\$1.75	\$0.00	\$34.38
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$20.35	\$7.75	\$1.61	\$0.00	\$29.71
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$45.23	\$7.75	\$16.61	\$0.00	\$69.59

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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**Apprentice - LINEMAN (Outside Electrical) - East Local 104**

**Effective Date - 09/03/2017**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$27.14	\$7.75	\$3.31	\$0.00	\$38.20
2	65	\$29.40	\$7.75	\$3.38	\$0.00	\$40.53
3	70	\$31.66	\$7.75	\$3.45	\$0.00	\$42.86
4	75	\$33.92	\$7.75	\$5.02	\$0.00	\$46.69
5	80	\$36.18	\$7.75	\$5.09	\$0.00	\$49.02
6	85	\$38.45	\$7.75	\$5.15	\$0.00	\$51.35
7	90	\$40.71	\$7.75	\$7.22	\$0.00	\$55.68

**Notes:**

**Apprentice to Journeyworker Ratio:1:2**

TELEDATA CABLE SPLICER <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	01/01/2016	\$28.98	\$4.25	\$3.12	\$0.00	\$36.35
TELEDATA LINEMAN/EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	01/01/2016	\$27.31	\$4.25	\$3.07	\$0.00	\$34.63
TELEDATA WIREMAN/INSTALLER/TECHNICIAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	01/01/2016	\$27.31	\$4.25	\$3.07	\$0.00	\$34.63
TREE TRIMMER <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	01/31/2016	\$18.51	\$3.55	\$0.00	\$0.00	\$22.06
This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is not on the ground. This classification does not apply to wholesale tree removal.						
TREE TRIMMER GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	01/31/2016	\$16.32	\$3.55	\$0.00	\$0.00	\$19.87
This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is on the ground. This classification does not apply to wholesale tree removal.						

**Additional Apprentice Information:**

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentice ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

**\*\*** Multiple ratios are listed in the comment field.

**\*\*\*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

**\*\*\*\*** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

SECTION 00830

ATTACHMENT B

EXCERPTS FROM CHAPTERS 30, 82 AND 149 OF THE MASSACHUSETTS  
GENERAL LAWS

## ATTACHMENT B

### Excerpts from Chapters 30, 82 and 149 of the Massachusetts General Laws

**NOTICE** - These are **NOT** the official versions of the Massachusetts General Laws (MGL). While reasonable efforts have been made to assure the accuracy of the excerpts provided, do not rely on this information without first checking an official edition of the MGL. If you are in need of legal advice or counsel, consult a lawyer. These excerpts include amendments to the General Laws passed through February 28, 2017. For laws enacted since that time, see the 2017 Session Laws.

**Certain excerpts from the Massachusetts General Laws are applicable to Construction contracts. Attention is directed to the following Sections of Chapter 149 as amended.**

#### **Section 25. Lodging, board and trade of public employees; statute part of employment contract.**

"Every employee in public work shall lodge, board, and trade where and with whom he elects; and no person or his agents or employees under contract with the commonwealth, a county, city or town, or with a department, board, commission or officer acting therefor, for the doing of public work shall directly or indirectly require, as a condition of employment therein, that the employee shall lodge, board or trade at a particular place or with a particular person. This section shall be made a part of the contract for such employment."

#### **Section 26. Public works; preference to veterans and citizens; wages.**

"In the employment of mechanics and apprentices, teamsters, chauffeurs and laborers in the construction of public works by the commonwealth, or by a county, town, authority or district, or by persons contracting or subcontracting for such works, preference shall first be given to citizens of the commonwealth who have been residents of the commonwealth for at least six months at the commencement of their employment who are veterans as defined in clause Forty-third of section 7 of chapter 4 and who are qualified to perform the work to which the employment relates and, within such preference, preference shall be given to service-disabled veterans; and secondly, to citizens of the commonwealth generally who have been residents of the commonwealth for at least six months at the commencement of their employment, and if they cannot be obtained in sufficient numbers, then to citizens of the United States, and every contract for such work shall contain a provision to this effect..."

#### **Section 34. Public contracts; stipulation as to hours and days of work; void contracts.**

"Every contract, except for the purchase of material or supplies, involving the employment of laborers, workmen, mechanics, foremen or inspectors, to which the commonwealth or any county or any town, subject to section thirty, is a party, shall contain a stipulation that no laborer, workman, mechanic, foreman or inspector working within the commonwealth, in the employ of the contractor, subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by the contract, shall be required or permitted to work more than eight hours in any one-day or more than forty-eight hours in any one week, or more than six days in any one

week, except in cases of emergency, or, in case any town subject to section thirty-one is a party to such a contract, more than eight hours in any one-day, except as aforesaid..."

**Section 34A. Contracts for public works; workers' compensation insurance; breach of contract; enforcement and violation of statute.**

"Every contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public building or other public works for the commonwealth or any political subdivision thereof shall contain stipulations requiring that the contractor shall, before commencing performance of such contract, provide by insurance for the payment of compensation and the furnishing of other benefits under chapter one hundred and fifty-two to all persons to be employed under the contract, and that the contractor shall continue such insurance in full force and effect during the term of the contract. No officer or agent contracting in behalf of the commonwealth or any political subdivision thereof shall award such a contract until he has been furnished with sufficient proof of compliance with the aforesaid stipulations. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the contract and shall operate as an immediate termination thereof. No cancellation of such insurance, whether by the insurer or by the insured, shall be valid unless written notice thereof is given by the party proposing cancellation to the other party and to the officer or agent who awarded the contract at least fifteen days prior to the intended effective date thereof, which date shall be expressed in said notice. Notice of cancellation sent by the party proposing cancellation by registered mail, postage prepaid, with a return receipt of the addressee requested, shall be a sufficient notice..."

**Section 34B. Contracts for public works; wages for reserve police officer.**

"Every contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public works for the commonwealth or any political subdivision thereof shall contain stipulations requiring that the contractor shall pay to any reserve police officer employed by him in any city or town the prevailing rate of wage paid to regular police officers in such city or town."

***Whenever general bids are invited for a contract subject to Section 44A, the following provision applies:***

**Section 44E. Filing of bids; forms; modular buildings.** Second paragraph of subdivision (2), clause E.

"The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards made subject to section 44A."



*For projects estimated to cost more than \$25,000, the following provision applies to sub-bidders:*

**Section 44F. Plans and specifications; sub-bids; form; contents.** First paragraph of clause I of subdivision (2) of section 44F.

“The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards of subcontracts subject to section 44F.”

**Section 44G. Allowances; alternates; weather protection devices.**

“(A) “Allowance” as used herein means a sum of money covering one or more items of labor or labor and materials which is designated in bid documents and which general bidders are required to use in computing their bids. The use of such allowances shall be prohibited in the award of any contract subject to the provisions of section forty-four A. Whenever the designer is unable to supply specifications for any item prior to the solicitation of bids, such item shall not be included in any contract subject to the provisions of section forty-four A. The awarding authority shall solicit bids for every such item separately pursuant to the provisions of section forty-four A after specifications for that item are prepared.

(B) Every alternate contained in the form for general bids shall be listed in a numerical sequence in order of priority. When the awarding authority decides to consider alternates in determining the lowest eligible and responsible bidder, the awarding authority shall consider the alternates in descending numerical sequence, such that no single alternate shall be considered unless every alternate preceding it on the list has been added to or subtracted from the base bid price.

(C) The use of options other than alternates in bid documents or bid forms subject to section forty-four A shall be prohibited under all circumstances.

(D) Every contract subject to section forty-four A shall include specifications for the installation of weather protection and shall require that the contractor shall install the same and that he shall furnish adequate heat in the area so protected during the months of November through March. Standards for such specifications shall be established by the commissioner or his designee.”

**Section 44J. Invitations to bid; notice; contents; violations; penalty.**

“(1) No public agency or authority of the commonwealth or any political subdivision thereof shall award any contract for which competitive bids are required pursuant to section forty-four A of this chapter or section thirty-nine M of chapter thirty, or for which competitive proposals are required pursuant to subsection (4) of section forty-four E of this chapter or section eleven C of chapter twenty-five A, unless a notice inviting bids or proposals therefor shall have been posted no less

than one week prior to the time specified in such notice for the receipt of said bids or proposals in a conspicuous place in or near the offices of the awarding authority, and shall have remained posted until the time so specified, and unless such notice shall also have been published at least once not less than two weeks prior to the time so specified in the central register published by the secretary of state pursuant to section twenty A of chapter nine and in a newspaper of general circulation in the locality of the proposed project, and on the COMMBUYS system administered by the operational services division. Said notice shall also be published at such other times and in such other newspapers or trade periodicals as the commissioner of capital asset management and maintenance may require, having regard to the locality of the work involved.

(2) Said notice shall specify the time and place where plans and specification of the proposed work may be had; the time and place of submission of general bids; and the time and place for opening of the general bids. For contracts subject to the provisions of section forty-four A to H, inclusive, of this chapter, said notice shall also specify the time and place for submission of filed sub-bids, where required pursuant to section forty-four F; and the time and place for opening of said filed sub-bids.

Said notice shall also provide sufficient facts concerning the nature and scope of such project, the type and elements of construction, and such other information as will assist applicants in deciding to bid on such contract.

(3) No contract or preliminary plans and specifications shall be split or divided for the purpose of evading the provisions of this section.

(4) General bids and filed sub-bids for any contract subject to this section shall be in writing and shall be opened in public at the time and place specified in the posted or published notice, and after being so opened shall be open to public inspection.

(5) The provisions of this section shall not apply to any transaction between the commonwealth and any public service corporation.

(6) The provisions of this section may be waived in cases of extreme emergency involving the health and safety of the people and their property, upon the written approval of said commissioner. The written approval shall contain a description of the circumstances and the reasons for the commissioner's determination.

(7) Whoever violates any provision of this section shall be punished by a fine of not more than ten thousand dollars or by imprisonment in the state prison for not more than three years or in a jail or house of correction for not more than two and one-half years, or by both said fine and imprisonment; and in the event of final conviction, said person shall be incapable of holding any office of honor, trust or profit under the commonwealth or under any county, district of municipal agency.

Each and every person who shall cause or conspire to cause any contract or preliminary plans and specifications to be split or divided for the purpose of evading the provisions of this section shall forfeit and pay to the commonwealth, a political subdivision thereof or other awarding authority

subject to this section, the sum of not more than five thousand dollars and, in addition, such person or persons shall pay, apportioned among them, double the amount of damages which the commonwealth or political subdivision thereof or other awarding authority may have sustained by reason of the doing of such act, together with the costs of the action.

(8) If an awarding authority rejects all general bids or does not receive any general bids, and advertises for a second opening of general bids with the original filed sub-bids as set forth in subsection (1) of section forty-four E the notice for receipt of such general bids may be published in the central register and elsewhere as required not less than one week prior to the time specified for such second opening of general bids.

(9) No request for proposals or invitation for bids issued under sections 38A ½ to 38O, inclusive, of chapter 7, section 11C of chapter 25A, section 39M of chapter 30, this section and sections 44A to 44H, inclusive, shall be advertised if the awarding authority's cost estimate is greater than 1 year old."

**Attention is directed to the following sections of Chapter 30 of the General Laws of Massachusetts as amended to date.**

**Section 38A. Price adjustment clause in contracts for road, bridge, water and sewer projects awarded under Sec. 39M**

"Contracts for road and bridge projects awarded as a result of a proposal or invitation for bids under section 39M shall include a price adjustment clause for each of the following materials: fuel, both diesel and gasoline; asphalt; concrete; and steel. Contracts for water and sewer projects awarded as a result of a proposal or invitation for bids under said section 39M shall include a price adjustment clause for fuel, both diesel and gasoline; liquid asphalt; and portland cement contained in cast-in-place concrete. A base price for each material shall be set by the awarding authority or agency and shall be included in the bid documents at the time the project is advertised. The awarding authority or agency shall also identify in the bid documents the price index to be used for each material. The price adjustment clause shall provide for a contract adjustment to be made on a monthly basis when the monthly cost change exceeds plus or minus 5 per cent."

**Section 39F. Construction contracts; assignment and subrogation; subcontractor defined; enforcement of claim for direct payment; deposit; reduction of disputed amounts.**

"(1) Every contract awarded pursuant to sections forty-four A to L inclusive, of chapter one hundred and forty-nine shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to section thirty-nine M of chapter thirty shall contain the following subparagraphs (a) through (h) and in each case those subparagraphs shall be binding between the general contractor and each subcontractor.

(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings

barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(b) Not later than the sixty-fifth-day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the general contractor for the account of that subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (a) and (b), the awarding authority shall act upon the demand as provided in this section.

(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less

any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided, that the awarding authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

(h) The awarding authority shall deduct from payments to a general contractor amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor.

(i) If the subcontractor does not receive payment as provided in subparagraph (a) or if the general contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the subcontractor may demand direct payment by following the procedure in subparagraph (d) and the general contractor may file a sworn reply as provided in that same subparagraph. A demand made after the first day of the month following that for which the subcontractor performed or furnished the labor and materials for which the subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general contractor. Thereafter the awarding authority shall proceed as provided in subparagraph (e), (f), (g), and (h).

(2) Any assignment by a subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of section twenty-nine of chapter one hundred forty-nine shall be invalid. The assignment and subrogation rights of the surety to amounts included in a

demand for direct payment which are in the possession of the awarding authority or which are on deposit pursuant to subparagraph (f) of paragraph (1) shall be subordinate to the rights of all subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) "Subcontractor" as used in this section (i) for contracts awarded as provided in sections forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall mean a person who files a sub-bid and receives a subcontract as a result of that filed sub-bid or who is approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, (ii) for contracts awarded as provided in paragraph (a) of section thirty-nine M of chapter thirty shall mean a person approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, and (iii) for contracts with the commonwealth not awarded as provided in forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall also mean a person contracting with the general contractor to supply materials used or employed in a public works project for a price in excess of five thousand dollars.

(4) A general contractor or a subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposited as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the awarding authority and the general contractor shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. Sections fifty-nine and fifty-nine B of chapter two hundred thirty-one shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to sections fifty-nine and fifty-nine B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any subcontractor with the petition of one or more subcontractors or the same general contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will prevent unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a subcontractor filing a demand for direct payment for which no funds due the general contractor are available for direct payment shall have a right to file a petition in court of equity against the awarding authority claiming a demand for direct payment is premature and such subcontractor must file the petition before the awarding authority has made a direct payment to the subcontractor and has made a deposit of the disputed portion as provided in part (iii) of subparagraph (e) and in subparagraph (f) of paragraph (1).

(5) In any petition to collect any claim for which a subcontractor has filed a demand for direct payment the court shall, upon motion of the general contractor, reduce by the amount of any deposit of a disputed amount by the awarding authority as provided in part (iii) of subparagraph

(e) and in subparagraph (f) of paragraph (1) any amount held under a trustee writ or pursuant to a restraining order or injunction.”

**Section 39G. Completion of public works; semi-final and final estimates; payments; extra work; disputed items.**

"Upon substantial completion of the work required by a contract with the commonwealth, or any agency or political subdivision thereof, for the construction, reconstruction, alteration, remodeling, repair or improvement of public ways, including bridges and other highway structures, sewers and water mains, airports and other public works, the contractor shall present in writing to the awarding authority its certification that the work has been substantially completed. Within twenty-one days thereafter, the awarding authority shall present to the contractor either a written declaration that the work has been substantially completed or an itemized list of incomplete or unsatisfactory work items required by the contract sufficient to demonstrate that the work has not been substantially completed. The awarding authority may include with such list a notice setting forth a reasonable time, which shall not in any event be prior to the contract completion date, within which the contractor must achieve substantial completion of the work. In the event that the awarding authority fails to respond, by presentation of a written declaration or itemized list as aforesaid, to the contractor's certification within the twenty-one-day period, the contractor's certification shall take effect as the awarding authority's declaration that the work has been substantially completed.

Within sixty-five days after the effective date of a declaration of substantial completion, the awarding authority shall prepare and forthwith send to the contractor for acceptance a substantial completion estimate for the quantity and price of the work done and all but one percent retainage, if held by the awarding authority, on that work, including the quantity, price and all but one percent retainage, if held by the awarding authority, for the undisputed part of each work item and extra work item in dispute but excluding the disputed part thereof, less the estimated cost of completing all incomplete and unsatisfactory work items and less the total periodic payments made to date for the work. The awarding authority also shall deduct from the substantial completion estimate an amount equal to the sum of all demands for direct payment filed by subcontractors and not yet paid to subcontractors or deposited in joint accounts pursuant to section thirty-nine F, but no contract subject to said section thirty-nine F shall contain any other provision authorizing the awarding authority to deduct any amount by virtue of claims asserted against the contract by subcontractors, material suppliers or others.

If the awarding authority fails to prepare and send to the contractor any substantial completion estimate required by this section on or before the date herein above set forth, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such substantial completion estimate at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston from such date to the date on which the awarding authority sends that substantial completion estimate to the contractor for acceptance or to the date of payment therefor, whichever occurs first. The awarding authority shall include the amount of such interest in the substantial completion estimate.

Within fifteen days after the effective date of the declaration of substantial completion, the awarding authority shall send to the contractor by certified mail, return receipt requested, a

complete list of all incomplete or unsatisfactory work items, and, unless delayed by causes beyond his control, the contractor shall complete all such work items within forty-five-days after the receipt of such list or before the then contract completion date, whichever is later. If the contractor fails to complete such work within such time, the awarding authority may, subsequent to seven-days' written notice to the contractor by certified mail, return receipt requested, terminate the contract and complete the incomplete or unsatisfactory work items and charge the cost of same to the contractor.

Within thirty days after receipt by the awarding authority of a notice from the contractor stating that all of the work required by the contract has been completed, the awarding authority shall prepare and forthwith send to the contractor for acceptance a final estimate for the quantity and price of the work done and all retainage, if held by the awarding authority, on that work less all payments made to date, unless the awarding authority's inspection shows that work items required by the contract remain incomplete or unsatisfactory, or that documentation required by the contract has not been completed. If the awarding authority fails to prepare and send to the contractor the final estimate within thirty days after receipt of notice of completion, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such final estimate at the rate hereinabove provided from the thirtieth day after such completion until the date on which the awarding authority sends the final estimate to the contractor for acceptance or the date of payment therefor, whichever occurs first, provided that the awarding authority's inspection shows that no work items required by the contract remain incomplete or unsatisfactory. Interest shall not be paid hereunder on amounts for which interest is required to be paid in connection with the substantial completion estimate as hereinabove provided. The awarding authority shall include the amount of the interest required to be paid hereunder in the final estimate.

The awarding authority shall pay the amount due pursuant to any substantial completion or final estimate within thirty-five days after receipt of written acceptance for such estimate from the contractor and shall pay interest on the amount due pursuant to such estimate at the rate hereinabove provided from that thirty-fifth day to the date of payment. Within 15 days, 30 days in the case of the commonwealth, after receipt from the contractor, at the place designated by the awarding authority, if such place is so designated, of a periodic estimate requesting payment of the amount due for the preceding periodic estimate period, the awarding authority shall make a periodic payment to the contractor for the work performed during the preceding periodic estimate period and for the materials not incorporated in the work but delivered and suitably stored at the site, or at some location agreed upon in writing, to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority, upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances. The awarding authority shall include with each such payment interest on the amount due pursuant to such periodic estimate at the rate herein above provided from the due date. In the case of periodic payments, the contracting authority may deduct from its payment a retention based on its estimate of the fair value of its claims against the contractor, a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and a retention to secure satisfactory performance of the contractual work not exceeding five per cent of the approved amount of any periodic payment, and the same right to retention shall apply to bonded subcontractors entitled to direct payment under section thirty-



nine F of chapter thirty; provided, that a five per cent value of all items that are planted in the ground shall be deducted from the periodic payments until final acceptance.

No periodic, substantial completion or final estimate or acceptance or payment thereof shall bar a contractor from reserving all rights to dispute the quantity and amount of, or the failure of the awarding authority to approve a quantity and amount of, all or part of any work item or extra work item.

Substantial completion, for the purposes of this section, shall mean either that the work required by the contract has been completed except for work having a contract price of less than one percent of the then adjusted total contract price, or substantially all of the work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the work required by the contract."

### **Section 39I. Deviations from plans and specifications.**

"Every contractor having a contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public building or public works for the commonwealth, or of any political subdivision thereof, shall perform all the work required by such contract in conformity with the plans and specifications contained therein. No wilful and substantial deviation from said plans and specifications shall be made unless authorized in writing by the awarding authority or by the engineer or architect in charge of the work who is duly authorized by the awarding authority to approve such deviations. In order to avoid delays in the prosecution of the work required by such contract such deviation from the plans or specifications may be authorized by a written order of the awarding authority or such engineer or architect so authorized to approve such deviation. Within thirty days thereafter, such written order shall be confirmed by a certificate of the awarding authority stating: (1) if such deviation involves any substitution or elimination of materials, fixtures or equipment, the reasons why such materials, fixtures or equipment were included in the first instance and the reasons for substitution or elimination, and, if the deviation is of any other nature, the reasons for such deviation, giving justification therefor; (2) that the specified deviation does not materially injure the project as a whole; (3) that either the work substituted for the work specified is of the same cost and quality, or that an equitable adjustment has been agreed upon between the contracting agency and the contractor and the amount in dollars of said adjustment; and (4) that the deviation is in the best interest of the contracting authority.

Such certificate shall be signed under the penalties of perjury and shall be a permanent part of the file record of the work contracted for.

Whoever violates any provision of this section wilfully and with intent to defraud shall be punished by a fine of not more than five thousand dollars or by imprisonment for not more than six months, or both."

**Section 39J. Public construction contracts; effect of decisions of contracting body or administrative board.**

“Notwithstanding any contrary provision of any contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or public works by the commonwealth, or by any county, city, town, district, board, commission or other public body, when the amount of the contract is more than five thousand dollars in the case of the commonwealth and more than two thousand dollars in the case of any county, city, town, district, board, commission or other public body, a decision, by the contracting body or by any administrative board, official or agency, or by any architect or engineer, on a dispute, whether of fact or of law, arising under said contract shall not be final or conclusive if such decision is made in bad faith, fraudulently, capriciously, or arbitrarily is unsupported by substantial evidence, or is based upon error of law.”

**Section 39K. Public building construction contracts; payments.**

"Every contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building by the commonwealth, or by any county, city, town, district, board, commission or other public body, when the amount is more than five thousand dollars in the case of the commonwealth and more than two thousand dollars in the case of any county, city, town, district, board, commission or other public body, shall contain the following paragraph: Within fifteen days (30 days in the case of the commonwealth, including local housing authorities) after receipt from the contractor, at the place designated by the awarding authority if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the awarding authority will make a periodic payment to the contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority, upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances, but less (1) a retention based on its estimate of the fair value of its claims against the contractor and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and less (3) a retention not exceeding five percent of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty-five-days after (a) the contractor fully completes the work or substantially completes the work so that the value of the work remaining to be done is, in the estimate of the awarding authority, less than one percent of the original contract price, or (b) the contractor substantially completes the work and the awarding authority takes possession for occupancy, whichever occurs first, the awarding authority shall pay the contractor the entire balance due on the contract less (1) a retention based on its estimate of the fair value of its claims against the contractor and of the cost of completing the incomplete and unsatisfactory items of work and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, or based on the record of payments by the contractor to the subcontractors under this contract if such record of payment indicates that the contractor has not paid subcontractors as provided in section thirty-nine F. If the awarding authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three

percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston commencing on the first day after said payment is due and continuing until the payment is delivered or mailed to the contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen days (twenty-four days in the case of the commonwealth) after receipt of such a periodic estimate from the contractor, at the place designated by the awarding authority if such a place is so designated. The contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor.

The awarding authority may make changes in any periodic estimate submitted by the contractor and the payment due on said periodic estimate shall be computed in accordance with the changes so made, but such changes or any requirement for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided, that the awarding authority may, within seven days after receipt, return to the contractor for correction, any periodic estimate which is not in the required form or which contains computations not arithmetically correct and, in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form and with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter. The provisions of section thirty-nine G shall not apply to any contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building to which this section applies.

All periodic estimates shall be submitted to the awarding authority, or to its designee as set forth in writing to the contractor, and the date of receipt by the awarding authority or its designee shall be marked on the estimate. All periodic estimates shall contain a separate item for each filed subtrade and each sub-subtrade listed in sub-bid form as required by specifications and a column listing the amount paid to each subcontractor and sub-subcontractor as of the date the periodic estimate is filed. The person making payment for the awarding authority shall add the daily interest provided for herein to each payment for each day beyond the due date based on the date of receipt marked on the estimate.

A certificate of the architect to the effect that the contractor has fully or substantially completed the work shall, subject to the provisions of section thirty-nine J, be conclusive for the purposes of this section.

Notwithstanding the provisions of this section, at any time after the value of the work remaining to be done is, in the estimation of the awarding authority, less than 1 per cent of the adjusted contract price, or the awarding authority has determined that the contractor has substantially completed the work and the awarding authority has taken possession for occupancy, the awarding authority may send to the general contractor by certified mail, return receipt requested, a complete and final list of all incomplete and unsatisfactory work items, including, for each item on the list, a good faith estimate of the fair and reasonable cost of completing such item. The general contractor shall then complete all such work items within 30 days of receipt of such list or before the contract completion date, whichever is later. If the general contractor fails to complete all incomplete and unsatisfactory work items within 45 days after receipt of such items furnished by

the awarding authority or before the contract completion date, whichever is later, subsequent to an additional 14 days' written notice to the general contractor by certified mail, return receipt requested, the awarding authority may terminate the contract and complete the incomplete and unsatisfactory work items and charge the cost of same to the general contractor and such terminations shall be without prejudice to any other rights or remedies the awarding authority may have under the contract. The awarding authority shall note any such termination in the evaluation form to be filed by the awarding authority pursuant to the provisions of section 44D of chapter 149."

**Section 39L. Public construction work by foreign corporations; restrictions and reports.**

"The commonwealth and every county, city, town, district, board, commission or other public body which, as the awarding authority, request proposals, bids or sub-bids for any work in the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or other public works (1) shall not enter into a contract for such work with, and shall not approve as a subcontractor furnishing labor and materials for a part of the work, a foreign corporation which has not filed with such awarding authority a certificate of the state secretary stating that the corporation has complied with requirements of section 15.03 of subdivision A of Part 15 of chapter 156D and the date of compliance, and further has filed all annual reports required by section 16.22 of subdivision B of Part 16 of said chapter 156D, and (2) shall report to the state secretary and to the department of corporations and taxation any foreign corporation performing work under such contract or subcontract, and any person, other than a corporation, performing work under such contract or subcontract, and residing or having a principal place of business outside the commonwealth."

**Section 39M. Contracts for construction and materials; manner of awarding.**

"(b) Specifications for such contracts, and specifications for contracts awarded pursuant to the provisions of said sections forty-four A to forty-four L of said chapter one hundred and forty-nine, shall be written to provide for full competition for each item of material to be furnished under the contract; except, however, that said specifications may be otherwise written for sound reasons in the public interest stated in writing in the public records of the awarding authority or promptly given in writing by the awarding authority to anyone making a written request therefor, in either instance such writing to be prepared after reasonable investigation. Every such contract shall provide that an item equal to that named or described in the said specifications may be furnished; and an item shall be considered equal to the item so named or described if, in the opinion of the awarding authority: (1) it is at least equal in quality, durability, appearance, strength and design, (2) it will perform at least equally the function imposed by the general design for the public work being contracted for or the material being purchased, and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the said specifications.

For each item of material the specifications shall provide for either a minimum of three named brands of material or a description of material which can be met by a minimum of three manufacturers or producers, and for the equal of any one of said named or described materials."

***For projects estimated to cost more than \$10,000, the following provision, section 39M subsection c, applies:***

“(c) The term "lowest responsible and eligible bidder" shall mean the bidder: (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who shall certify, that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who shall certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; (4) who, where the provisions of section 8B of chapter 29 apply, shall have been determined to be qualified thereunder; and (5) who obtains within 10 days of the notification of contract award the security by bond required under section 29 of chapter 149; provided that for the purposes of this section the term "security by bond" shall mean the bond of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority; provided further, that if there is more than 1 surety company, the surety companies shall be jointly and severally liable.”

**Section 39N. Construction contracts; equitable adjustment in contract price for differing subsurface or latent physical conditions.**

"Every contract subject to section forty-four A of chapter one hundred and forty-nine or subject to section thirty-nine M of chapter thirty shall contain the following paragraph in its entirety and an awarding authority may adopt reasonable rules or regulations in conformity with that paragraph concerning the filing, investigation and settlement of such claims:

If, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly."

**Section 39O. Contracts for construction and materials; suspension, delay or interruption due to order of awarding authority; adjustment in contract price; written claim.**

"Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety and, in the event a suspension, delay, interruption or failure to act of the awarding authority increases the cost of performance to any subcontractor, that subcontractor shall have the same rights against the general contractor for payment for an increase in the cost of his performance as provisions (a) and (b) give the general contractor against the awarding authority, but nothing in provisions (a) and (b) shall in any way change, modify or alter any other rights which the general contractor or the subcontractor may have against each other.

(a) The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.

(b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim."

**Section 39P. Contracts for construction and materials; awarding authority's decisions on interpretation of specifications, etc.; time limit; notice.**

"Every contract subject to section thirty-nine M of this chapter or section forty-four A of chapter one hundred forty-nine which requires the awarding authority, any official, its architect or engineer to make a decision on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, shall require that the decision be made promptly and, in any event, no later than thirty days after the written submission for decision; but if such decision requires extended investigation and study, the awarding authority, the official, architect or engineer shall, within thirty days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty day period and the date by which the decision will be made."

### **Section 39Q. Contracts for capital facility construction; contents; annual claims report.**

“(1) Every contract awarded by any state agency as defined by section thirty-nine A of chapter seven for the construction, reconstruction, alteration, remodeling, repair or demolition of any capital facility as defined by the aforesaid section thirty-nine A shall contain the following subparagraphs (a) through (d) in their entirety:

(a) Disputes regarding changes in and interpretations of the terms or scope of the contract and denials of or failures to act upon claims for payment for extra work or materials shall be resolved according to the following procedures, which shall constitute the exclusive method for resolving such disputes. Written notice of the matter in dispute shall be submitted promptly by the claimant to the chief executive official of the state agency which awarded the contract or his designee. No person or business entity having a contract with a state agency shall delay, suspend, or curtail performance under that contract as a result of any dispute subject to this section. Any disputed order, decision or action by the agency or its authorized representative shall be fully performed or complied with pending resolution of the dispute.

(b) Within thirty days of submission of the dispute to the chief executive official of the state agency or his designee, he shall issue a written decision stating the reasons therefor, and shall notify the parties of their right of appeal under this section. If the official or his designee is unable to issue a decision within thirty days, he shall notify the parties to the dispute in writing of the reasons why a decision cannot be issued within thirty days and of the date by which the decision shall issue. Failure to issue a decision within the thirty-day period or within the additional time period specified in such written notice shall be deemed to constitute a denial of the claim and shall authorize resort to the appeal procedure described below. The decision of the chief executive official or his designee shall be final and conclusive unless an appeal is taken as provided below.

(c) Within twenty-one calendar days of the receipt of a written decision or of the failure to issue a decision as stated in the preceding subparagraph, any aggrieved party may file a notice of claim for an adjudicatory hearing with the division of hearing officers or the aggrieved party may file an action directly in a court of competent jurisdiction and shall serve copies thereof upon all other parties in the form and manner prescribed by the rules governing the conduct of adjudicatory proceedings of the division of hearing officers. In the event an aggrieved party exercises his option to file an action directly in court as provided in the previous sentence, the twenty-one day period shall not apply to such filing and the period of filing such action shall be the same period otherwise applicable for filing a civil action in superior court. The appeal shall be referred to a hearing officer experienced in construction law and shall be prosecuted in accordance with the formal rules of procedure for the conduct of adjudicatory hearings of the division of hearing officers, except as provided below. The hearing officer shall issue a final decision as expeditiously as possible, but in no event more than one hundred and twenty calendar days after conclusion of the adjudicatory hearing, unless the decision is delayed by a request for extension of time for filing post-hearing briefs or other submissions assented to by all parties. Whenever, because an extension of time has been granted, the hearing officer is unable to issue a decision within one hundred and twenty days, he shall notify all parties of the reasons for the delay and the date when the decision will issue. Failure to issue a decision within the one hundred and twenty-day period or within the additional

period specified in such written notice shall give the petitioner the right to pursue any legal remedies available to him without further delay.

(d) When the amount in dispute is less than ten thousand dollars, a contractor who is party to the dispute may elect to submit the appeal to a hearing officer experienced in construction law for expedited hearing in accordance with the informal rules of practice and procedure of the division of hearing officers. An expedited hearing under this subparagraph shall be available at the sole option of the contractor. The hearing officer shall issue a decision no later than sixty days following the conclusion of any hearing conducted pursuant to this subparagraph. The hearing officer's decision shall be final and conclusive, and shall not be set aside except in cases of fraud.

(2) The commissioner of administration shall require the division of hearings officers to prepare annually a report concerning the construction contract claims submitted to the division during the preceding twelve months, in such form as the commissioner shall prescribe. The report shall contain, at a minimum, the following information: the number of claims submitted; the names of all parties to each such claim; a brief description of the claim; the date of submission and of disposition of the claim; its disposition, whether by settlement, withdrawal, default or written decision; and the number of claims currently pending. The original of the report shall be submitted to the commissioner of administration by January fifteenth, and a copy shall be filed with the state librarian and shall be a public document."

**Section 39R. Keeping and maintaining of books, records and accounts; statement of management on internal accounting control; financial statements; enforcement.**

"(a) The words defined herein shall have the meaning stated below whenever they appear in this section:

(1) "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A to forty-four H, inclusive, of chapter one hundred and forty-nine, which is for an amount or estimated amount greater than one hundred thousand dollars.

(2) "Contract" means any contract awarded or executed pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A through forty-four H, inclusive, of chapter one hundred and forty-nine, which is for amount or estimated amount greater than one hundred thousand dollars.

(3) "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.



(4) "Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.

(5) "Audit," when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a *certified* opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

(6) "Accountant's Report," when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which he has made and sets forth his opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the contractor.

(7) "Management," when used herein, means the chief executive officers, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the contractor.

(8) Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

(b) Subsection (a)(2) hereof notwithstanding, every agreement or contract awarded or executed pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven, or eleven C of chapter twenty-five A, and pursuant to section thirty-nine M of chapter thirty or to section forty-four A through H, inclusive, of chapter one hundred and forty-nine, shall provide that:

(1) The contractor shall make, and keep for at least six years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the contractor, and

(2) until the expiration of six years after final payment, the office of inspector general, and the commissioner of capital asset management and maintenance shall have the right to examine any books, documents, papers or records of the contractor or of his subcontractors that directly pertain to, and involve transactions relating to, the contractor or his subcontractors, and

(3) if the agreement is a contract as defined herein, the contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements

filed with the awarding authority, including in his description the date of the change and reasons therefor, and shall accompany said description with a letter from the contractor's independent certified public accountant approving or otherwise commenting on the changes, and

(4) if the agreement is a contract as defined herein, the contractor has filed a statement of management on internal accounting controls as set forth in paragraph (c) below prior to the execution of the contract, and

(5) if the agreement is a contract as defined herein, the contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph (d) below.

(c) Every contractor awarded a contract shall file with the awarding authority a statement of management as to whether the system of internal accounting controls of the contractor and subsidiaries reasonably assures that:

(1) transactions are executed in accordance with management's general and specific authorization;

(2) transactions are recorded as necessary:

i. to permit preparation of financial statements in conformity with generally accepted accounting principles, and

ii. to maintain accountability for assets;

(3) access to assets is permitted only in accordance with management's general or specific authorization; and

(4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Every contractor awarded a contract shall also file with the awarding authority a statement prepared and signed by an independent certified public accountant, stating that he has examined the statement of management on internal accounting controls, and expressing an opinion as to:

(1) whether the representations of management in response to this paragraph, and paragraph (b) above are consistent with the result of management's evaluation of the system of internal accounting controls; and

(2) whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

(d) Every contractor awarded a contract by the commonwealth or by any political subdivision thereof shall annually file with the commissioner of capital asset management and maintenance during the term of the contract a financial statement prepared by an independent certified public

accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statements shall be made available to the awarding authority upon request.

(e) The office of inspector general, the commissioner for capital asset management and maintenance and any other awarding authority shall enforce the provisions of this section. The commissioner of capital asset management and maintenance may after providing an opportunity for the inspector general and other interested parties to comment, promulgate pursuant to the provisions of chapter thirty A such rules, regulations and guidelines as are necessary to effectuate the purposes of this section. Such rules, regulations and guidelines may be applicable to all awarding authorities. A contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to section forty-four C of chapter one hundred and forty-nine.

(f) Records and statements required to be made, kept or filed under the provisions of this section shall not be public records as defined in section seven of chapter four and shall not be open to public inspection; provided, however, that such records and statements shall be made available pursuant to the provisions of clause (2) of paragraph (b)."

### **Section 39S. Contracts for construction; requirements.**

"(a) As used in this section the word "person" shall mean any natural person, joint venture, partnership corporation or other business or legal entity. Any person submitting a bid for, or signing a contract to work on, the construction, reconstruction, alteration, remodeling or repair of any public work by the commonwealth, or political subdivision thereof, or by any county, city, town, district, or housing authority, and estimated by the awarding authority to cost more than \$10,000, and any person submitting a bid for, or signing a contract to work on, the construction, reconstruction, installation, demolition, maintenance or repair of any building by a public agency, estimated to cost more than \$10,000, shall certify on the bid, or contract, under penalties of perjury, as follows:

(1) That he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and (3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

(b) Any employee found on a worksite subject to this section without documentation of successful completion of a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration shall be subject to immediate removal.

(c) The attorney general, or his designee, shall have the power to enforce this section including the power to institute and prosecute proceedings in the superior court to restrain the award of contracts and the performance of contracts in all cases where, after investigation of the facts, he has made a finding that the award or performance has resulted in violation, directly or indirectly, of subsection (b), and he shall not be required to pay to the clerk of the court an entry fee in connection with the institution of the proceeding.”

#### **Section 40. Discharge or release of bonds.**

"Bonds given to the commonwealth, any county, city, town or political subdivision to secure the performance of contracts for the construction or repair of public buildings or other public works may be discharged or released by the awarding authority, upon such terms as it deems expedient, after the expiration of one year from the time of completion, subject to section thirty-nine K, of the work contracted to be done; provided that no claim filed under said bond is pending, and provided further, that no such bonds shall be discharged or released prior to the expiration of all special guarantees provided for in the contract unless new bonds in substitution therefor specifically relating to the unexpired guarantees shall be taken."

**Attention is directed to the following sections of Chapter 82 of the General Laws of Massachusetts as amended to date.**

#### **Section 40. Definitions.**

"The following words, as used in this section and sections 40A to 40E, inclusive, shall have the following meanings:

**"Company"**, natural gas pipeline company, petroleum or petroleum products pipeline company, public utility company, cable television company, and municipal utility company or department that supply gas, electricity, telephone, communication or cable television services or private water companies within the city or town where such excavation is to be made.

**"Description of excavation location"**, such description shall include the name of the city or town, street, way, or route number where appropriate, the name of the streets at the nearest intersection to the excavation, the number of the buildings closest to the excavation or any other description, including landmarks, utility pole numbers or other information which will accurately define the location of the excavation.

**"Emergency"**, a condition in which the safety of the public is in imminent danger, such as a threat to life or health or where immediate correction is required to maintain or restore essential public utility service.

**"Excavation"**, an operation for the purpose of movement or removal of earth, rock or the materials in the ground including, but not limited to, digging, blasting, augering, backfilling, test boring, drilling, pile driving, grading, plowing in, hammering, pulling in, jacking in, trenching, tunneling and demolition of structures, excluding excavation by tools manipulated only by human power for gardening purposes and use of blasting for quarrying purposes.

**"Excavator"**, any entity including, but not limited to, a person, partnership, joint venture, trust, corporation, association, public utility, company or state or local government body which performs excavation operations.

**"Premark"**, to delineate the general scope of the excavation or boring on the paved surface of the ground using white paint, or stakes or other suitable white markings on nonpaved surfaces. No premarking shall be acceptable if such marks can reasonably interfere with traffic or pedestrian control or are misleading to the general public. Premarking shall not be required of any continuous excavation that is over 500 feet in length.

**"Safety zone"**, a zone designated on the surface by the use of standard color-coded markings which contains the width of the facilities plus not more than 18 inches on each side.

**"Standard color-coded markings"**, red - electric power lines, cables, conduit or light cables; yellow - gas, oil, street petroleum, or other gaseous materials; orange - communications cables or conduit, alarm or signal lines; blue - water, irrigation and slurry lines; green - sewer and drain lines; white - premark of proposed excavation.

**"System"**, the underground plant damage prevention system as defined in section 76D of chapter 164."

#### **Section 40A. Excavations; notice.**

"No excavator installing a new facility or an addition to an existing facility or the relay or repair of an existing facility shall, except in an emergency, make an excavation, in any public or private way, any company right-of-way or easement or any public or privately owned land or way, unless at least 72 hours, exclusive of Saturdays, Sundays and legal holidays but not more than 30 days before the proposed excavation is to be made, such excavator has premarked not more than 500 feet of the proposed excavation and given an initial notice to the system. Such initial notice shall set forth a description of the excavation location in the manner as herein defined. In addition, such initial notice shall indicate whether any such excavation will involve blasting and, if so, the date and the location at which such blasting is to occur.

The notice requirements shall be waived in an emergency as defined herein; provided, however, that before such excavation begins or during a life-threatening emergency, notification shall be given to the system and the initial point of boring or excavation shall be premarked. The excavator shall ensure that the underground facilities of the utilities in the area of such excavation shall not be damaged or jeopardized.

In no event shall any excavation by blasting take place unless notice thereof, either in the initial notice or a subsequent notice accurately specifying the date and location of such blasting shall have been given and received at least 72 hours in advance, except in the case of an unanticipated obstruction requiring blasting when such notice shall be not less than four hours prior to such blasting. If any such notice cannot be given as aforesaid because of an emergency requiring blasting, it shall be given as soon as may be practicable but before any explosives are discharged."

**Section 40B. Designation of location of underground facilities.**

“Within 72 hours, exclusive of Saturdays, Sundays and legal holidays, from the time the initial notice is received by the system or at such time as the company and the excavator agree, such company shall respond to the initial notice or subsequent notice by designating the location of the underground facilities within 15 feet in any direction of the premarking so that the existing facilities are to be found within a safety zone. Such safety zone shall be so designated by the use of standard color-coded markings. The providing of such designation by the company shall constitute prima facie evidence of an exercise of reasonable precaution by the company as required by this section; provided, however, that in the event that the excavator has given notice as aforesaid at a location at which because of the length of excavation the company cannot reasonably designate the entire location of its facilities within such 72 hour period, then such excavator shall identify for the company that portion of the excavation which is to be first made and the company shall designate the location of its facilities in such portion within 72 hours and shall designate the location of its facilities in the remaining portion of the location within a reasonable time thereafter. When an emergency notification has been given to the system, the company shall make every attempt to designate its facilities as promptly as possible.”

**Section 40C. Excavator’s responsibility to maintain designation markings; damage caused by excavator.**

“After a company has designated the location of its facilities at the location in accordance with section 40B, the excavator shall be responsible for maintaining the designation markings at such locations, unless such excavator requests remarking at the location due to the obliteration, destruction or other removal of such markings. The company shall then remark such location within 24 hours following receipt of such request.

When excavating in close proximity to the underground facilities of any company when such facilities are to be exposed, non-mechanical means shall be employed, as necessary, to avoid damage in locating such facility and any further excavation shall be performed employing reasonable precautions to avoid damage to any underground facilities including, but not limited to, any substantial weakening of structural or lateral support of such facilities, penetration or destruction of any pipe, main, wire or conduit or the protective coating thereof, or damage to any pipe, main, wire or conduit.

If any damage to such pipe, main, wire or conduit or its protective coating occurs, the company shall be notified immediately by the excavator responsible for causing such damage.

The making of an excavation without providing the notice required by section 40A with respect to any proposed excavation which results in any damage to a pipe, main, wire or conduit, or its protective coating, shall be prima facie evidence in any legal or administrative proceeding that such damage was caused by the negligence of such person.”

**Section 40D. Local laws requiring excavation permits; public ways.**

“Nothing in this section shall affect or impair local ordinances or by-laws requiring a permit to be obtained before excavation in a public way or on private property; but notwithstanding any general

or special law, ordinance or by-law to the contrary, to the extent that any permit issued under the provisions of the state building code or state fire code requires excavation by an excavator on a public way or on private property, the permit shall not be valid unless the excavator notifies the system as required pursuant to sections 40 and 40A, before the commencement of the excavation, and has complied with the permitting requirements of chapter 82A.”

**Section 40E. Violations of Secs. 40A to 40E; punishment.**

“Any person or company found by the department of telecommunications and energy, after a hearing, to have violated any provision of sections 40A to 40E, inclusive, shall be fined \$1000 for the first offense and not less than \$5,000 nor more than \$10,000 for any subsequent offense within 12 consecutive months as set forth by the rules of said department; provided, however, that nothing herein shall be construed to require forfeiture of any penal sum by a state or local government body for violation of section 40A or 40C; and provided, further, that nothing herein shall be construed to require the forfeiture of any penal sum by a residential property owner for the failure to premark for an excavation on such person's residential property.”

**Attention is directed to the following sections of Chapter 30 of the Acts of 2009.**

**Section 33.**

“(a) Notwithstanding any general or special law to the contrary, the following requirements shall apply to any public works project funded by the American Recovery and Reinvestment Act of 2009 where the amount of construction costs under any contract awarded is likely to exceed \$1,000,000. For the purposes of this section, "public works" shall mean building or work the construction of which is carried on by authority of the commonwealth, or by a county, town, authority or district, or with funds of a federal agency or the commonwealth or a county, city, town, authority or district to serve the interest of the general public, regardless of whether title thereof is in the commonwealth or in a county, city, town, authority or district; provided, however, that for the purposes of this definition, "construction" shall have the meaning provided in section 27D of chapter 149 of the General Laws.

(b) For any public works project subject to subsection (a), the specifications set forth in any request for responses shall include a requirement that, on a per project basis, not less than 20 per cent of the total hours of employees receiving an hourly wage who are directly employed on the site of the project, employed by the contractor or a subcontractor and subject to the prevailing wage, shall be performed by apprentices in bona fide apprentice training programs as provided in sections 11H and 11I of chapter 23 of the General Laws which are approved by the division of apprentice training in the executive office of labor and workforce development.

(c) During the performance of a public works project subject to subsections (a) and (b), the contractor shall submit periodic reports to the awarding authority with records indicating the total hours worked by all journeymen and apprentices in positions subject to the apprentice requirement. In any instance in which the apprentice hours do not constitute 5 per cent of the total hours of employees subject to the apprentice requirement, the contractor shall submit a plan to the awarding authority describing how the contractor shall comply with the apprentice requirement.

(d) The attorney general shall have all the necessary powers to require compliance with the requirements of subsections (a), (b) and (c) therewith, including the power to institute and prosecute proceedings in the superior court to restrain the award of contracts and the performance of contracts. Prior to award of the contract, an awarding authority may petition the attorney general for approval to adjust the requirements set forth in said subsections (a), (b) and (c). The attorney general may adjust these requirements only if he determines that compliance with these requirements is not feasible or if application of the requirements would be preempted by federal law.

(e) An awarding authority serving a low-income population may require additional specifications that address the needs of its clients including, but not limited to, preferential hiring for residents of public housing authorities for available apprenticeship positions.

(f) Subject to appropriation, the division of apprentice training shall enhance its outreach efforts to underserved populations in order to increase and diversify the number of apprentices in the commonwealth.”

### **Section 39.**

“Any entity located in the commonwealth that receives federal funds through the American Recovery and Reinvestment Act of 2009 shall provide information as directed by the secretary of administration and finance regarding the use of the funds. The required information shall include, but not be limited to, the reporting information required by the federal government and any other information deemed necessary by the secretary to administer the American Recovery and Reinvestment Act of 2009 responsibly, efficiently and transparently. To the extent possible, the secretary shall work to streamline the reporting of this information, minimize duplication of data entry by recipients and ensure data consistency. The secretary may issue regulations to effectuate this reporting requirement.”

### **Section 40.**

“Employers and hiring agents on all projects funded in whole or in part by the American Recovery and Reinvestment Act of 2009 shall post notices of available employment opportunities to the commonwealth’s job bank or the one-stop career centers closest to where the projects shall be located. The postings shall contain such information as directed by the secretary of labor and workforce development. The secretary may issue regulations to effectuate this job posting requirement.”

## **END OF SECTION**

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SECTION 00830

ATTACHMENT C

MINORITY AND WOMEN BUSINESS ENTERPRISES

## ATTACHMENT C

### MINORITY AND WOMEN BUSINESS ENTERPRISES

#### GOALS FOR CONSTRUCTION PROJECTS

Minority-owned Business Enterprise (MBE), Women-owned Business Enterprise (WBE) and Equal Employment Opportunity polices of the Massachusetts Water Resources Authority (MWRA) are applicable to this Contract. The Contractor shall comply with all applicable laws and regulations pertaining to nondiscrimination, equal opportunity and affirmative action, including without limitation executive orders and rules and regulations of federal and state agencies of competent jurisdiction. The Contractor shall make positive efforts to achieve: (1) a minority employee work force goal of 15.3 percent, (2) a woman employee work force goal of 6.90 percent, (3) a goal of 7.24 percent participation of Minority-owned Business Enterprise(s), and (4) a goal of 3.60 percent participation of Woman-owned Business Enterprise(s) within project contracts. At a minimum, the Contractor should allow MBEs and WBEs the maximum feasible opportunity to compete for subagreements to be performed under the project.

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SECTION 00830

ATTACHMENT D

CHANGE ORDERS

## ATTACHMENT D

### CHANGE ORDERS

#### Policy:

This section supplements Article 11, Amending the Contract Documents; Changes in the Work, in the General Conditions and Supplementary Conditions.

All executed change orders submitted to the Engineer for review and processing must be prepared in accordance with the attached change order format (Appendix A) with the appropriate number of copies, calculation sheet(s) (Appendix B) and all other supporting documentation necessary for evaluation. Failure to comply with these instructions will result in delays in processing the change order.

In order to avoid possible delays with approval of change orders, at the beginning of the project and as circumstances warrant, the Contractor shall submit a list of construction equipment, identifying major pieces of equipment to be utilized on the project. The list shall include the Contractor's designation, if any, the manufacturer, model, year of manufacture, serial number, size and horsepower of equipment. The Contractor shall also provide for approval a proposed bluebook equipment rental rate development that separately lists for each piece of equipment the monthly rental rate, area adjustment factor, depreciation factor, estimated operating cost per hour and total hourly rate. In the event the Contractor fails or is unable to provide appropriate rate information the Engineer may develop equipment rental rates for use on change orders.

#### Payment of Change Orders:

Payment of all change orders shall be in accordance with the relevant provisions of Massachusetts General Laws, Chapter 30, Section 39G for non-building construction and Section 39K for building construction as amended from time to time.

Payment of change orders shall be made in accordance with one of the following three methods:

- A. Existing unit prices as set forth in the contract; or
  - B. Agreed upon lump sum or unit prices; or
  - C. Time and materials
- A. Payment for work for which there is a unit price in the contract:

Where the contract contains a unit price for work and the Engineer orders a change for work of the same kind as other work contained in the contract and is performed under similar physical conditions, the Contractor shall accept full and final payment at the contract unit price(s) for the acceptable quantities. Under certain circumstances, the unit prices may be subject to revaluation and adjustment. See Article 13 in the Supplementary Conditions.

B. Payment for work or materials for which no price is contained in the contract:

If the Engineer directs, the Contractor shall submit promptly in writing to the Engineer an offer to do the required work on a lump sum or unit price basis, as specified by the Engineer. The stated price, either lump sum or unit price, shall be divided so as to show that it is the sum of:

1. The estimated cost of Labor, plus
2. Direct Labor Cost, plus
3. Material and Freight Costs, plus
4. Equipment Costs, plus
5. An amount not to exceed 15% of the sum of items 1 through 4 for overhead and profit, plus (if applicable),
6. In the case of work done by a subcontractor an amount not to exceed 5%, for the general contractor of the sum of the cost (not including subcontractor's overhead and profit) of items 1 through 4 for his overhead and profit (less, if applicable),
7. Credits for work deleted from the contract, including actual costs of the deleted work plus the percentage of overhead, profit, bonds and insurance attributable to such credit amount.

C. Payment for work on a time and materials basis:

Unless an agreed lump sum and/or unit price is obtained as noted above and is so stated in the change price, the Contractor shall accept as full payment for which no agreement is contained in contract, an amount equal to:

1. The estimated cost of Labor, plus
2. The Direct Labor Costs, plus
3. Equipment Costs, plus
4. Material and Freight Costs, plus
5. An amount not to exceed 15% of the sum of items 1 through 4 for overhead and profit, plus, if applicable,
6. In the case of work done by a subcontractor an amount not to exceed 5%, for the general contractor of the sum of the cost (not including subcontractor's overhead and profit) of items 1 through 4 for his overhead and profit (less, if applicable),
7. Credit for work deleted from the Contract, including actual costs of the deleted work plus the percentage of overhead, profit, bonds and insurance attributable to such credit amount.

Explanation of items 1 through 7 as outlined in "B" and "C" above:

1. Labor - Only those workers employed on the project who are doing the extra work, including the foreman in charge, are allowable. General foremen, superintendents, or other supervisory personnel are considered to be included in the overhead markup as provided in items 5 and/or 6. Hourly labor rates in excess of those as listed in the contract wage rates require documentation. As a minimum, an explanation and the appropriate copy of the certified payroll are required.
2. Direct Labor Costs - These costs are limited to those which are required in the contract document. Coverage in excess of the contract provisions, secured by the contractor/subcontractor(s) at his option, are ineligible. The following list of typical direct labor charges is provided for your assistance and is in no way intended to be complete or all encompassing:

Workman's Compensation

Federal/State: Social Security Tax and Unemployment Tax;

Health, Welfare and Pension Benefits; (this cost is included in the wage rates appearing in the Attachment A - Massachusetts Wage Rates.

Liability insurance:	Bodily injury; excess umbrella; property damage; public liability
----------------------	---

Blasters insurance:	If applied to any required direct labor costs
---------------------	---

Builders risk insurance:	If applied to any required direct labor costs
--------------------------	---

Experience modification insurance:	If applied to any required direct labor costs
------------------------------------	---

Surcharges:	If applied to any required direct labor costs
-------------	---

Following award and prior to execution of a construction contract, the Contractor and filed subbidders (where applicable) shall submit for review by the Owner, documentation to establish the markup percentage(s).

The documented direct labor markup for this contract may be adjusted on an annual basis as measured from the date the contract is executed. The contract agreement will provide for the establishment of the Direct Labor Cost percentage.

3. Material and Freight - Only those materials required as a result of the change order and reasonable freight charges for delivery of same are allowable.
4. Equipment - Only the equipment required as a result of the change order is allowable. Equipment rental rates shall be governed by the current EquipmentWatch, division of

Intertec Publishing [Formerly Nielson/Dataquest] Rental Rate Bluebook for Construction Equipment (the "Bluebook"). In determining the rental rate the following shall apply:

- a. For equipment already on the project - the monthly prorated rental rate by the hourly use shall be applicable;
- b. For equipment not on the project the daily rate, the weekly rate, or monthly rate will prevail, whichever will prove to be most cost effective. Small tools and manual equipment are examples of costs not allowable under this item. These costs are considered to be included in the overhead markup as provided in items 5 and/or 6.

(1 Month (Normal Use) = 176 hours)

- 5.& 6. Overhead and Profit - All other costs not previously mentioned are considered to be included in this item, be it for the general contractor or subcontractor(s).
7. Credits - Work deleted, material and equipment removed from the contract, stored and/or returned shall be credited to the cost of the change order, less documented costs.

This change order will be prepared in such manner as to clearly separate Eligible and Ineligible Costs (as applicable to state-funded projects).

The Contractor shall furnish itemized statements of the cost of the work ordered and shall give the Engineer access to all accounts, bills and vouchers relating thereto; and unless the Contractor shall furnish such itemized statements, and access to all accounts, bills and vouchers, he shall not be entitled to payment for any items of extra work for which such information is sought by the Engineer.

APPENDIX A

CHANGE ORDER  
(Enter Project Name)  
(Enter Location)

Sheet \_\_ of

Date \_\_\_\_\_

Project No. \_\_\_\_\_

Contract No. \_\_\_\_\_

Change Order No. \_\_\_\_\_

Owner's Name: \_\_\_\_\_

Owner's Address: \_\_\_\_\_

Contractor's Name: \_\_\_\_\_

Contractor's Address: \_\_\_\_\_

Item 1:

Description of Change: \_\_\_\_\_

Reason for Change: \_\_\_\_\_

Backup Information: \_\_\_\_\_

Cost: \$ \_\_\_\_\_

Item 2

Description of Change: \_\_\_\_\_

Reason for Change: \_\_\_\_\_

Backup Information: \_\_\_\_\_

Cost: \$ \_\_\_\_\_



Change Order (Continued)  
(Enter Project Name)  
(Enter Location)

Sheet \_\_\_ of

Date \_\_\_\_\_

Project No. \_\_\_\_\_

Contract No. \_\_\_\_\_

Change Order No. \_\_\_\_\_

Contract Amount (As Bid) \$ \_\_\_\_\_

Amount of Previous Change Orders \$ \_\_\_\_\_

Net Change in Contract Price (this Change Order) \$ \_\_\_\_\_

Total Adjusted Contract Price (including this Change Order) \$ \_\_\_\_\_

This Change Order extends the time to complete the work by \_\_\_\_ calendar days.

The extended completion date is \_\_\_\_\_.

This Change Order checked by: \_\_\_\_\_  
Resident Representative Date

This Change Order is requested by: \_\_\_\_\_

This Change Order is recommended by:

\_\_\_\_\_  
Consultant Engineer P.E. # Date

The undersigned agree to the terms of the Change Order.

\_\_\_\_\_  
Contractor Date

\_\_\_\_\_  
Owner Date

Certification of Appropriation under M.G.L. c.44, s.31C: Adequate funding in an amount sufficient to cover the total cost of this change order is available.

By: \_\_\_\_\_  
Certification Officer (Auditor, Accountant, Treasurer) Date

Do not write below this space: this space reserved for STATE AGENCY APPROVAL

Appendix B  
Example Calculation Sheet

1. Labor

Foreman	10 hours @	\$10.00/hour	\$100.00
Engineer	10 hours @	8.80/hour	85.00
Operator	10 hours @	9.50/hour	95.00
Laborers	24 hours @	7.00/hour	<u>168.00</u>
			\$448.00

2. Direct Labor Cost (use the agreed upon Direct Labor Cost)

\*(30)% of \$448.

\*(used for example purposes only) \$ 134.00

3. Materials & Freight

150 l.f. of 12" pipe @ \$2.00/l.f.	\$ 300.00
15 v.f. precast SMH	1,700.00
Freight (slip#___ enclosed)	<u>25.00</u>
	\$2,025.00

4. Equipment

1 Backhoe	10 hours @	\$ 80.00/hour	\$ 800.00
1 Truck-crane	10 hours @	100.00/hour	<u>1000.00</u>
			\$1800.00

**TOTAL (items 1 through 4): \$4,407.00**

5. (15%) markup for Overhead, Profit

(15%) of \$4,407 \$ 661.00

6. (5 %) markup on subcontractor's cost for general contractor (if subcontractor is involved)

(5 %) of \$4,407 \$ 220.00

7. Credits (deductibles) -\$323.00

**TOTAL COST: \$4,965.00**

**Reminder:** Provide support documentation as necessary i.e. vouchers, correspondence, calculation, photographs, reports.

END OF SECTION

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## SECTION 00890

### PERMITS

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION:

This Section provides specific information and defines specific requirements of the Contractor regarding the preparation and acquisition of permits required to perform the work of this project.

##### 1.02 RELATED WORK:

- A. Section 01110, CONTROL OF WORK AND MATERIALS
- B. Section 01550, SIGNAGE (TRAFFIC CONTROL)
- C. Section 01562, DUST CONTROL
- D. Section 01570, ENVIRONMENTAL PROTECTION
- E. Section 02240, DEWATERING
- F. Section 02300, EARTHWORK

##### 1.03 GENERAL REQUIREMENTS:

- A. The Owner has obtained or will obtain and pay for the permits listed below, which are required for this project. The Contractor shall assist in obtaining certain permits, as indicated. The Contractor shall obtain and pay for all other permits required, as defined under the Permits subsection of Section 00700, GENERAL CONDITIONS.

<u>Permits by Owner</u>	<u>Status</u>
Road Opening Permit	*
Trench Permit (520 CMR 14.00)(eff. date 3/1/09)	*
One-Time-Only Discharge Request to Discharge from CIPP Lining Process (permit application attached for reference)	**
Request to Conduct a Root Control Project (permit application attached for reference)	**
*Contractor shall prepare permit application after contract is awarded. Owner will pay for and/or waive the permit application fee, if applicable.  **Contractor shall prepare permit application after contract is awarded. Owner will submit permit application to MWRA for approval.	

## PART 2 - PRODUCTS

Not Used.

## PART 3 – EXECUTION

### 3.01 PERFORM WORK IN ACCORDANCE WITH REQUIREMENTS:

- A. The Contractor shall perform the work in accordance with the Contract Documents, including the attached permits/order of conditions, and any applicable municipal requirements.
- B. The Contractor shall submit the completed “One-Time-Only Discharge Request to Discharge from CIPP Lining Process” and “Request to Conduct a Root Control Project” permits to the Engineer for approval and submission to the Massachusetts Water Resources Authority (MWRA). Related permit applications are attached.
- C. Prior to commencing any construction activities, the Contractor shall demonstrate to the Owner and the Engineer, through on-site inspection and submitting copies of permits or approvals, that it is in full compliance with the terms and conditions of all permits specified herein. The Contractor shall maintain full compliance with all permits throughout the performance of the work, and upon request, grant access to permitting authorities to inspect the site for the purpose of verifying such compliance.

END OF SECTION

**MWRA ONE-TIME-ONLY DISCHARGE  
REQUEST PERMIT**



**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
**TOXIC REDUCTION AND CONTROL**  
2 GRIFFIN WAY  
CHELSEA, MASSACHUSETTS 02150-3334

**One-Time-Only Discharge Request**

**To discharge from a Cured-in-Place Pipe (CIPP) Lining process as part of a sewer rehabilitation project into the Municipality or Authority sewerage system**

*Please, allow three weeks for processing this request*

Name of Municipality: \_\_\_\_\_

Project Name: \_\_\_\_\_

**Name of the person from the Municipality to contact concerning the information provided herein.** *(Please, sign the signature page of this questionnaire, without a signature from the Municipality the MWRA will not be able to process this request.)*

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Facsimile No.: \_\_\_\_\_

E Mail: \_\_\_\_\_

**Contractor designated by the Municipality to conduct the project.**

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Facsimile No.: \_\_\_\_\_

E Mail: \_\_\_\_\_

MWRA Permit Number: \_\_\_\_\_

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**Person designated by the Municipality to receive correspondence from the MWRA  
regarding this project.**

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Facsimile No.: \_\_\_\_\_

---

## GENERAL INFORMATION:

### Please answer all of the questions

(If more space is needed, attach additional pages).

a) Cured-in-Place Pipe (CIPP)Liner is defined as a woven or non-woven or combination of woven and non-woven material surrounded or impregnated with resin which when installed and processed, forms to the shape and size of the interior walls of the host conduit as defined in ASTM Standard F1216.

b) Host Conduit is defined as the existing pipeline to be rehabilitated by CIPP Lining.  
The host conduit for this project must be indicated on the Contract Drawings.

1. Indicate the project scope. Provide pipe location and pipe length and diameter of each pipe to be treated. Use a pipe identification naming scheme that references the drawings and that will be recognizable by all parties. Identify all of the connection (using the name provide in Attachment A of the MWRA Municipal Discharge Permit) of the receiving MWRA interceptor and submit a diagram and drawing that will trace the flow from the project pipe to the MWRA interceptor.

Project scope and location: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Pipe Location Sewer Connection of the receiving MWRA interceptor (Provide name in Attachment A of the MWRA Municipal Discharge Permit)	Pipe Length (Feet)	Pipe Diameter (Inches)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____





6. Indicate all source(s) of wastewater curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, and, etc to be discharged into MWRA sewer system from this project.

Wastewater Type(s)	Source(s)
<b>Curing water</b>	<hr/> <hr/>
<b>Cooling water</b>	<hr/> <hr/>
<b>Rinsing water</b>	<hr/> <hr/>
<b>Pre-cleaning water</b>	<hr/> <hr/>
<b>Post-cleaning water</b>	<hr/> <hr/>
<b>Other (Describe)</b> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/>
<b>Other (Describe)</b> <hr/> <hr/>	<hr/> <hr/>

7. Describe the proposed pretreatment for the wastewater curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, and, etc and provide equipment/flow diagram(s).

8. Indicate the storage method for treated and/or untreated curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, etc, and provide its capacity in gallons prior to discharge into the MWRA sanitary sewer system.

<b>Wastewater Type(s)</b>	<b>Storage method prior to discharge into MWRA sanitary sewer system.</b>	<b>Storage capacity (gallons)</b>
<b>Curing\lining process water</b>		
<b>Cooling water</b>		
<b>Rinsing water</b>		
<b>Pre-cleaning water</b>		
<b>Post-cleaning water</b>		
<b>Other (<i>Describe</i>)</b> <hr/> <hr/>		

9. Indicate proposed volume of wastewater (curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, and, etc..) flow into the MWRA sewer system per day gallons per day (GPD).

Wastewater Type(s)	Volume(GPD) Discharge into MWRA sanitary sewer system	Pretreatment Yes/No	Pretreatment Type(s)
Curing\lining process water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Cooling water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Rinsing water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Pre-cleaning water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Post-cleaning water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Other ( <i>Describe</i> ) _____ _____		Yes <input type="checkbox"/> No <input type="checkbox"/>	

10. Describe other method(s) for the collection and disposal for the curing\lining process wastewater, cooling water, and/or rinse water if pretreatment is not viable, and the discharge to the MWRA sanitary sewer system is not authorized.

11. Indicate if solids will be generated from the treatment process, including solidified styrene and other solid byproducts. All solids must be removed from the cure water and subsequent cooling and rinsing operations, prior to discharge into MWRA sewer system, pursuant 360 C.M.R. 10.023(8).

12. Indicate proposed date(s) of discharge into the MWRA sewer system.

**Anticipated first day of discharge:** \_\_\_\_\_

**Anticipated last day of discharge:** \_\_\_\_\_

**Proposed hours of discharge into MWRA sewer system:** \_\_\_\_\_

13. Provide the construction schedule for the project including specific proposed date(s) and start and end times. If specific dates are not known, please use Day 1 (one) for taking the pipe out of service and count forward from there. If individual operating time will take less than twenty-four hours, specify start and end times in military time.

<b>Action(s)</b>	<b>Date (mm/dd/yyyy)</b>	<b>Operating Time (hrs:min:sec)</b>	<b>Comments(s)</b>
<b>Taking pipe out of service</b>			
<b>Pre-cleaning of pipe (Start)</b>			
<b>Pre-cleaning of pipe (End)</b>			
<b>Line installation (Start)</b>			
<b>Line installation (End)</b>			
<b>Curing process (Start)</b>			
<b>Curing process (End)</b>			
<b>Cooling process (Start)</b>			
<b>Cooling process (End)</b>			
<b>Rinsing (Start)</b>			
<b>Rinsing (End)</b>			
<b>Return pipe to service</b>			
<b>Other (Describe)</b>			

14. Indicate how you will ensure that sufficient capacity (gallons) at the construction zone in the event of a storm event. Describe how flow through the pipe will be diverted around the construction zone and provide rerouting plans, and pipe blockage techniques that you will employ. Specify materials that will be used and storage measures that will be employed.



## 15. CERTIFICATION STATEMENT AND SIGNATURE:

The questionnaire for a One-Time-Only Discharge Request must be signed and dated by an authorized representative. If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the sewer system, a new authorization satisfying the requirements of this section must be submitted to the MWRA prior to or together with any reports to be signed by an authorized representative.

An authorized representative of a municipality includes:

- a) a responsible public official, including a Mayor, City Manager, Town Administrator, Chair of the Board of Selectman, District Manager, or any other person who performs similar policy or decision-making functions for the municipality, or the director, manager, or superintendent of the department responsible for operating or overseeing the operation of the sewer system, if authority to sign documents has been assigned or delegated to the individual in accordance with the municipality's procedures.
- b) the duly authorized representative of the individual designated in (a) of this section if:
  - i) the authorization is made in writing by the individual described in (a);
  - ii) the authorization specifies either an individual or a position having responsibility for the overall operation of the sewer system from which the discharge originates, such as the position of superintendent, or a position of equivalent responsibility, or having overall responsibility for environmental matters for the municipality;
  - iii) the written authorization is submitted to the MWRA.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the sewer system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Please Print Name of Authorized Representative

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

**PLEASE, ALLOW THREE WEEKS FOR PROCESSING THIS REQUEST**

*Do not alter this form*

To discharge wastewater from a sewer pipe lining/curing project into the Authority sewer system. Submit the completed form to:

Massachusetts Water Resources Authority  
Toxic Reduction and Control  
2 Griffin Way, Chelsea MA 02150-3334  
Attention: Kattia Thomas, Project Manager, Permitting

If you have any questions regarding the approval process, you may contact Kattia Thomas, at 617-305-5667.

**MWRA REQUEST TO CONDUCT A ROOT  
CONTROL PROJECT**

Submit your request for approval to use the foaming root control herbicide to Kattia Thomas, Project Manager, Permitting, Massachusetts Water Resources Authority, Toxic Reduction and Control, 2 Griffin Way, Chelsea MA 02150-3334. Also, you may fax the request to Ms. Thomas, the fax number is 617-371-1604.

If you have any questions regarding the approval process, you may contact Kattia Thomas, at 617-305-5667.



MASSACHUSETTS WATER RESOURCES AUTHORITY  
TOXIC REDUCTION AND CONTROL  
2 GRIFFIN WAY  
CHELSEA, MASSACHUSETTS 02150-3334

Request To Conduct  
A Root Control Project

Name of Municipality: \_\_\_\_\_

Name of the person from the Municipality to contact concerning the information provided herein. *(Please, sign page 2 of this questionnaire, without a signature from the municipality the MWRA will not be able to process this request.)*

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Facsimile No.: \_\_\_\_\_

Person designated by the Municipality to receive correspondence from the MWRA regarding this project.

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Facsimile No.: \_\_\_\_\_

---

1. Provide a description of the project.

2. Indicate the location and length (linear feet) of pipe to be treated?  
*Provide street name(s) and provide a map if applicable.*

3. Indicate the name of the active ingredient that will be used each day.  
*Provide the MSDS(s) for the chemical(s) that will be used.*
4. Indicate the name and volume (gallons) of the solvent or water and the active ingredient to be used each day.

\_\_\_\_\_  
Solvent Name (provide the name)

\_\_\_\_\_  
Volume (gallons/day)

\_\_\_\_\_  
Active Ingredient Name

\_\_\_\_\_  
Volume (gallons/day)

5. The total pounds of solution (the active ingredient) to be used each day?
6. The total pounds of solution (the active ingredient) to be used for the entire project?
7. The total number of days the pipes will be treated?  
Anticipated first day of the project: \_\_\_\_\_  
Anticipated last day of the project: \_\_\_\_\_

8. The time of day for the treatment?

9. The amount of time (hours) the active ingredient will remain in the sewer pipe after the treatment process?

\_\_\_\_\_  
Signature (*Municipality*)

\_\_\_\_\_  
Date

*FAX this page to Kattia Thomas, Proj. Mgr, Permitting, TRAC, the fax number is 617-371-1604.*

PLEASE, ALLOW THREE WEEKS FOR PROCESSING THIS REQUEST



## SECTION 01014

### SCOPE AND SEQUENCE OF WORK

#### PART 1- GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section of the specifications covers the scope and sequence of work for the Phase # 10 Sanitary Sewer Rehabilitations in Arlington, Massachusetts, including:

The scope of work of the Base Bid includes approximately: 60 linear feet of pipe bursting (two (2) parallel 8-inch cast iron siphon barrels approximately 30 linear feet); installation of approximately 134 linear feet of HDPE siphon pipe; replacement of 40 linear feet of 6-inch gravity sewer pipe; replacement of two (2) sewer siphon structures; set-up of a temporary sewer bypass system for the siphon replacement; and other related tasks in the Town of Arlington, Massachusetts.

The scope of work of the Alternate Bid No. 1 includes approximately: 26 linear feet of open cut point repairs of sanitary sewers at two (2) locations; replacement of 15 linear feet of building connections at one (1) location; installation of four (4) precast concrete sewer manholes; 924 linear feet of root treatment; 4,944 linear feet of cured-in-place pipe; grouting 101 service connections in cured-in-place pipe; cutting of six (6) protruding service connections; exterior grouting and interior sealing of 253 vertical feet of sewer manholes; grout and patch one (1) sewer manhole; install seven (7) manhole inflow dishes; replacement of one (1) manhole frame and cover; 1,000 linear feet of cleaning and inspection of sewers; 4,944 linear feet of post-construction flow isolation; and other related tasks in the Town of Arlington, Massachusetts.

The scope of work for Alternate Bid No. 2 includes approximately: 1,075 linear feet of 18-inch cured-in-place pipe; grouting two (2) service connections in cured-in-place pipe; inspecting, testing, and sealing of six (6) service connections, exterior grouting and interior sealing of 24 vertical feet of sewer manholes; raising one (1) manhole frame and cover to grade; 1,330 linear feet of post-construction flow isolation; and other related tasks in the Town of Arlington, Massachusetts.

The scope of work for Alternate Bid No. 3 includes approximately: 262 linear feet of root treatment; 1,341 linear feet of cured-in-place pipe; grouting 29 service connections in cured-in-place pipe; 262 linear feet of structural cured-in-place pipe; grouting seven (7) service connections in structural cured-in-place pipe; exterior grouting and interior sealing of 77 vertical feet of sewer manholes; grout and patch three (3) sewer manholes; raising three (3) manhole frame and cover to grade; 1,603 linear feet of post-construction flow isolation; and other related tasks in the Town of Arlington, Massachusetts.

The scope of work for Alternate Bid No. 4 includes approximately: 803 linear feet of root treatment; 900 linear feet of cured-in-place pipe; grouting 13 service connections in cured-in-place

pipe; cutting of one (1) protruding service connections; exterior grouting and interior sealing of 35 vertical feet of sewer manholes; building a bench and invert in three (3) sewer manholes; 900 linear feet of post-construction flow isolation; and other related tasks in the Town of Arlington, Massachusetts.

B. The Contractor shall furnish all labor, materials, equipment, and incidentals required to complete the work as shown on the drawings and as specified herein.

C. Sewer system rehabilitations include:

1. Pipe bursting of existing cast iron sewer mains to replace with HDPE pipe (refer to Section 02225, PIPE BURSTING CONSTRUCTION and Section 02624, HIGH DENSITY POLYETHYLENE PIPE);
2. Chemical root treatment (refer to Section 02437, SEWER LINE CHEMICAL ROOT TREATMENT);
3. Cleaning and inspection of sewer mains as described in Section 02440, SEWER CLEANING AND INSPECTION);
4. Performing open cut repairs in sewer mains to replace defective pipe (refer to Section 02442, POINT REPAIR OF GRAVITY (OPEN CUT));
5. Installation of new precast sewer manholes (refer to Section 02631, PRECAST MANHOLES);
6. Lining of sewer mains (manhole to manhole) to repair and seal multiple cracks and holes which are leaking or have the potential to leak (refer to Section 02428, CURED-IN-PLACE PIPE);
7. Rehabilitating service connections including cutting protruding services; television inspecting, pressure testing, and grouting to repair and seal cracks and holes which are leaking or have the potential to leak or to seal a reinstated service connection at a liner (refer to Section 02443, SERVICE CONNECTION REHABILITATION);
6. Rehabilitating manholes including, invert sealing, exterior sealing and interior coating, grouting and patching manholes to stop leaks, installing inflow dishes, replacing frame and cover sets, and raising frame and cover sets to grade (refer to Section 02435, SEWER MANHOLE REHABILITATION);
7. Flow isolation shall be performed as directed by the Engineer and on all rehabilitated reaches following the completion of construction as described in 02427, POST CONSTRUCTION FLOW ISOLATION.



1.02 RELATED WORK:

A. SECTION 01110 - CONTROL OF WORK AND MATERIALS

PART 2 – PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.01 SEQUENCE OF WORK:

- A. Root treatment of sewers shall be conducted first. Any other work in the root treated segments of sewer (manhole to manhole) shall not be performed until a waiting period has passed in accordance with Section 02437, SEWER LINE CHEMICAL ROOT TREATMENT.
- B. Contractor shall coordinate with the Owner, Engineer, and school personnel prior to beginning work in any school areas.
- C. Cleaning and inspecting shall be performed after root treatment (if necessary) and prior to all other pipeline rehabilitation work in each segment of sewer (manhole to manhole).
- D. Replacement (Open-Cut) of gravity sewers and sewer service connections shall be conducted prior to any other trenchless pipeline work being conducted in that line segment.
- G. Installation of precast sewer manholes shall be conducted prior to any other trenchless pipeline work being conducted in the connecting line segments.
- H. Cutting of protruding service connections required in a segment of sewer (manhole to manhole) shall be performed prior to the installation of cured-in-place pipe or pressure testing and grouting of service connections required in that segment.
- I. Cured-in-place pipe (manhole to manhole) required in a segment of sewer (manhole to manhole) shall be completed prior to any pressure testing or grouting of service connections required in that segment.
- J. Cured-in-place pipe (manhole to manhole) shall be completed prior to any cementitious lining in adjacent manholes.
- K. All work may be scheduled at the Contractor's discretion within the time of contract so long as it adheres to this scope and sequence of work and all plans and specifications. The schedule is also subject to approval by the Engineer.

- L. Final paving related to rehabilitations shall be completed prior to May 15, 2019.
- M. All rehabilitated reaches shall be flow isolated after completion of all other construction tasks as described in Section 02427, POST CONSTRUCTION FLOW ISOLATION. Post construction flow isolation shall be performed during a period of high groundwater during the retest inspection or at the Engineer's discretion.
- N. MYSTIC STREET SEWER SIPHON
  - a. A temporary bypass system shall be installed prior to beginning of any excavation work.
  - b. The existing siphon chambers, MA120 and MA 121, shall be removed and disposed of prior to any adjacent pipeline work.
  - c. Following removal of existing structures, pipe bursting shall be performed on the existing siphon barrels and new siphon chambers shall be installed.
  - d. Installed HDPE pipe shall be extended to meet new siphon structures.
  - e. The temporary bypass system shall be removed following completion of all other work.

END OF SECTION

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## SECTION 01110

### CONTROL OF WORK AND MATERIALS

#### PART 1 – GENERAL

Not applicable.

#### PART 2 – PRODUCTS

Not applicable.

#### PART 3 - EXECUTION

##### 3.01 HAULING, HANDLING AND STORAGE OF MATERIALS:

- A. The Contractor shall, at its own expense, handle and haul all materials furnished by it and shall remove any of its surplus materials at the completion of the work.
- B. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by it that are liable to injury and shall be responsible for any loss of or damage to any equipment or materials by theft, breakage, or otherwise.
- C. All excavated materials and equipment to be incorporated in the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the work. Materials and equipment shall be kept neatly piled and compactly stored in such location as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.
- D. The Contractor shall be responsible for all damages to the work under construction during its progress and until final completion and acceptance even though partial payments have been made under the Contract.

##### 3.02 EASEMENTS:

- A. As indicated on the drawings, the work is located in easements obtained by the Owner. The Contractor has no rights outside of the easements unless they are obtained from the property owner.
- B. Contractor shall schedule work so that it will cause minimum inconvenience and nuisance to abutting property owners, over the shortest possible time.
- C. Easements shall be kept clean; no rubbish or discarded construction materials shall be allowed to accumulate. Storage of excess construction materials, including soil, ledge, equipment, or machinery on easements will not be allowed.

- D. Restoration of fences, shrubs, trees and grass shall be completed promptly following completion of the work in an easement, to minimize disruption and inconvenience to property owners.
- E. Unless approved by the Engineer, the use of easements for ease of access to and egress from other areas of the project will not be permitted.

### 3.03 OPEN EXCAVATIONS:

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property. The Contractor shall, at its own expense, provide suitable and safe means for completely covering all open excavations and for accommodating travel when work is not in progress.
- B. Bridges provided for access to private property during construction shall be removed when no longer required.
- C. The length of open trench will be controlled by the particular surrounding conditions but shall always be confined to the limits prescribed by the Engineer.
- D. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, then special construction procedures shall be taken, such as limiting the length of trench and prohibiting stocking excavated material in the street.
- E. All street excavations shall be completely closed at the end of each work day. Backfilling or use of steel plates of adequate strength to carry traffic shall be used.

### 3.04 MAINTENANCE OF TRAFFIC:

- A. Unless permission to close the street is received in writing from the proper authority, all excavated materials and equipment shall be placed so that vehicular and pedestrian traffic may be safely maintained at all times.
- B. Should the Chief of Police deem it necessary, uniformed officers will be assigned to direct traffic. The Contractor shall make all arrangements in obtaining uniformed officers required.
- C. The Contractor shall at its own expense, as directed by the Police Traffic Control/Safety Officer, provide and erect acceptable barricades, barrier fences, traffic signs, and all other traffic devices not specifically covered in a bid item, to protect the work from traffic, pedestrians, and animals. The Contractor shall provide sufficient temporary lighting such as lanterns/flashers (electric battery operated) or other approved illuminated traffic signs and devices to afford adequate protection to the traveling public, at no additional cost to the Owner. See Section 01552, CONSTRUCTION ZONE SAFETY PLAN.

- D. The Contractor shall furnish all construction signs that are deemed necessary by and in accordance with Part VI of the Manual on Uniform Traffic Control Devices as published by the U.S. Department of Transportation. In addition, the Contractor may be required to furnish up to 128 square feet of additional special construction warning signs. Size and exact wording of signs shall be determined by the Engineer during construction.
- E. The intent of policing is to ensure public safety by direction of traffic. Police officers are not to serve as watchmen to protect the Contractor's equipment and materials.
- F. Nothing contained herein shall be construed as relieving the Contractor of any of its responsibilities for protection of persons and property under the terms of the Contract.

3.05 CARE AND PROTECTION OF PROPERTY:

The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be promptly restored by the Contractor, at its expense, to a condition similar or equal to that existing before the damage was done, to the satisfaction of the Engineer.

3.06 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES:

- A. All existing buildings, utilities, pipes, poles, wires fences, curbing, property line markers and other structures which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the contractor. Should such property be damaged, it shall be restored by the Contractor, at no additional cost to the Owner.
- B. The Contractor shall determine the location of all underground structures and utilities (including existing water services, drain lines, electrical lines, and sewers). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by Contractor.
- C. When fences interfere with the Contractor's operations, it shall remove and (unless otherwise specified) promptly restore them in accordance with Section 01564 EXISTING FENCES.
- D. On paved surfaces the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels which are shaped so as to cut or otherwise damage such surfaces.
- E. All property damaged by the Contractor's operations shall be restored to a condition at least equal to that in which it was found immediately before work was begun. Suitable materials and methods shall be used for such restoration.

- F. Restoration of existing property and structures shall be carried out as promptly as practicable and shall not be left until the end of the construction period.

3.07 MAINTENANCE OF FLOW:

- A. The Contractor shall at its own cost, provide for the flow of sewers and drains interrupted during the progress of the work, and shall immediately cart away and dispose of all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the Engineer well in advance of the interruption of any flow.
- B. All existing drainage facilities including, but not limited to; brooks, streams, canals, channels, ditches, culverts, catch basins and drainage piping shall be adequately safeguarded so as not to impede drainage or to cause siltation of downstream areas in any manner whatsoever. If the Contractor damages or impairs any of the aforesaid drainage facilities, it shall repair the same within the same day.
- C. At the conclusion of the work, the Contractor shall remove all silt in drainage structures caused by its operations as described in Section 01740, CLEANING UP.

3.08 REJECTED MATERIALS AND DEFECTIVE WORK:

- A. Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the specifications shall forthwith be removed from the work by the Contractor, and shall not be made use of elsewhere in the work.
- B. Any errors, defects or omissions in the execution of the work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor and in a manner satisfactory to the Engineer.
- C. The Contractor shall reimburse the Owner for any expense, losses or damages incurred in consequence of any defect, error, omission or act of the Contractor or its employees, as determined by the Engineer, occurring previous to the final payment.

3.09 SANITARY REGULATIONS:

Sanitary conveniences for the use of all persons employed on the work, properly screened from public observation, shall be provided in sufficient numbers in such manner and at such locations as may be approved. The contents shall be removed and disposed of in a satisfactory manner as the occasion requires. The Contractor shall rigorously prohibit the committing of nuisances within, on or about the work. Any employees found violating these provisions shall be discharged and not again employed on the work without the written consent of the Engineer. The sanitary conveniences specified above shall be the obligation and responsibility of the Contractor.

### 3.10 SAFETY AND HEALTH REGULATIONS:

This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations (454 CMR 10.0 et. seq.)." The Contractor shall be familiar with the requirements of these regulations.

### 3.11 SITE INVESTIGATION:

The Contractor acknowledges that it has satisfied itself as to the conditions existing at the site of the work, the type of equipment required to perform this work, the quality and quantity of the materials furnished insofar as this information is reasonably ascertainable from an inspection of the site, as well as from information presented by the drawings and specifications made a part of this contract. Any failure of the Contractor to acquaint itself with available information will not relieve it from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusion or interpretation made by the Contractor on the basis of the information made available by the Owner.

### 3.12 ELECTRIC SERVICE:

- A. The Contractor shall make all necessary applications and arrangements and pay for all fees and charges for electrical energy for power and light necessary for the proper completion of this contract during its entire progress. The Contractor shall provide and pay for all temporary wiring, switches, connections, and meters.
- B. There shall be sufficient electric lighting so that all work may be done in a workmanlike manner where there is not sufficient daylight.

### 3.13 HAZARDOUS WASTE:

Should the Contractor, while performing work under this contract, uncover hazardous materials, as defined in Massachusetts Hazardous Waste Regulations 310 CMR 30.00, he shall immediately notify the Engineer. The Contractor is not, and has no authority to act as, a handler, generator, operator or disposer of hazardous or toxic substances found or identified at the site, and the Owner shall undertake all such functions.

### 3.14 SEWER SERVICE CONNECTIONS:

- A. All sewer service connections shall be identified and located prior to each segment replacement to expedite reconnection.
- B. The Contractor shall affix a written notice to the door of each home that has sewer service on the segment to be replaced 48-hours prior to disconnection of the service and again the day of disconnection.

- C. Flow from the existing sewer services shall be bypass pumped as specified in Section 01575, HANDLING EXISTING FLOWS.
- D. Once the new mainline is available for connection, the existing service pipeline shall be removed to at or near the property line and replaced as described in Section 02530, BUILDING CONNECTIONS.

END OF SECTION

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## SECTION 01140

### SPECIAL PROVISIONS

#### PART 1 - GENERAL

Not applicable.

#### PART 2 - PRODUCTS

Not applicable.

#### PART 3 - EXECUTION

##### 3.01 WATER FOR CONSTRUCTION PURPOSES:

- A. In locations where water is in sufficient supply, the Contractor may be allowed to use water without charge for jetting backfill and other construction purposes. The express approval of the Owner shall be obtained before water is used. All requests for hydrant usage shall be conveyed through the Engineer at least 18 hours prior to desired use. The Owner may require the Contractor to provide a clean and tested valve and meter for obtaining water onsite. Otherwise, water may be obtained from a designated hydrant at the Owner's DPW office at 51 Grove Street. Operation of any hydrant may be limited to the Owner's staff. Waste of water by the Contractor shall be sufficient cause for withdrawing the privilege of unrestricted use.
- B. If no water is available, the Contractor shall supply water at no additional cost to the Owner.

##### 3.02 PIPE LOCATION:

Pipe shall be located substantially as indicated on drawings. The Owner reserves the right, acting through the Engineer, to make such modifications as may be deemed desirable to avoid interference with existing structures or for other reasons.

##### 3.03 DIMENSIONS OF EXISTING STRUCTURES:

Where the dimensions and locations of existing structures are of critical importance in the installation or connections of new work, the Contractor shall verify such dimensions and locations in the field before the fabrication of any material or equipment that is dependent on the correctness of such information.

3.04 OCCUPYING PRIVATE PROPERTY:

The Contractor shall not enter upon nor occupy with men, equipment or materials any property outside of the public highways or Owner's easements, except with the written consent of the property owner or property owner's agent.

3.05 EXISTING UTILITY LOCATIONS – CONTRACTOR'S RESPONSIBILITY:

- A. The location of existing underground services and utilities shown on the drawings is based on available records. It is not warranted that all existing utilities and services are shown, or that shown locations are correct. The Contractor shall be responsible for having the utility companies locate their respective utilities on the ground prior to excavating.
- B. To satisfy the requirements of Massachusetts law, Chapter 82, Section 40, the Contractor shall, at least 72 hours, exclusive of Saturdays, Sundays and holidays, prior to excavation in the proximity of telephone, gas, cable television and electric utilities, notify the utilities concerned by calling "DIG SAFE" at telephone number 1-888-344-7233 and MWRA Permitting Department, Field Operations at (617) 305-5956.
- C. The Contractor shall coordinate all work involving utilities and shall satisfy itself as to the existing conditions of the areas in which it is to perform his work. It shall conduct and arrange its work so as not to impede or interfere with the work of other contractors working in the same or adjacent areas.

3.06 COORDINATION OF WORK:

The General Contractor shall be responsible for coordinating its own work as well as that of any subcontractors. It shall be responsible for notification of the Engineer when each phase of work is expected to begin and the approximate completion date.

3.07 TIME FOR COMPLETION OF CONTRACT:

The time for completion of this contract is stipulated in the Form of/for General Bid. The Bidder shall base its bid on completing the proposed work by the completion date stipulated in Section 00410, FORM OF GENERAL BID/FORM FOR GENERAL BID.

3.08 MAINTENANCE OF TRENCH SURFACE:

After backfilling and compacting the trench, the Contractor shall be responsible for keeping the ground surface dry and passable at all times until the surface has been restored to original conditions.

3.09 COMPLIANCE WITH PERMITS:

- A. The Contractor shall perform all work in conformance with requirements of the Permits, which appear in Section 00890, PERMITS.

3.10 CUTTING, FITTING, AND PATCHING:

- A. The Contractor shall do all cutting, fitting, or patching of its work that may be required to make its several parts come together properly and fit it to receive or be received by work of other Contractors, as shown upon or reasonably implied by the drawings and the specifications for the completed structure, including all existing work.
- B. The Contractor shall not endanger any work by cutting, digging, or otherwise and shall not cut or alter the work of any other Contractor, save with the consent of the Engineer.
- C. All holes or openings required to be made in new or existing work, particularly at pipe, conduit, or other penetrations not covered by escutcheons or plates shall be neatly patched. All such holes shall be made completely watertight as approved by the Engineer.
- D. Size and locations of holes required in steel, concrete, or other structural or finish materials for piping, wiring, ducts, etc., which have not been located and detailed on the drawings shall be approved by the Engineer prior to layout and cutting thereof. All holes shall be suitably reinforced as required by the Engineer.
- E. Workmanship and materials of patching and repair work shall match the adjacent similar work and shall conform to the applicable sections of the specification. Patches and joints with existing work shall provide, as applicable in each case, visual, structural, and waterproofing continuity.

3.11 CONTRACTOR'S REPRESENTATIVE:

The Contractor shall designate a representative who will be available to respond to emergency calls by the Owner at any time day and night and on weekends and holidays should such a situation arise.

3.12 HOURS OF CONSTRUCTION ACTIVITY:

- A. The Contractor shall conduct all construction activity between 7:00 a.m. and 5:00 p.m., Monday through Friday. No construction work shall be allowed on Saturdays, Sundays or Holidays without written authorization from the Owner.
- B. The Owner will provide personnel for assistance in locating and operating valves for digs with water conflicts at no cost to the Contractor during the Owner's normal working hours (Monday through Friday 7:00 a.m. to 3:00 p.m.). When this assistance is required by the Contractor outside of the Owner's normal working hours the cost will be incurred by the Contractor at the prevailing overtime rate of pay for the personnel providing the assistance. The Owner will bill the Contractor directly.

3.13 CONSTRUCTION CREWS:

The Contractor shall not increase the number of construction crews assigned to the work without providing one-week advance notice to the Engineer.

3.14 HANDLING OF ASBESTOS CEMENT PIPE:

The Contractor will be required to connect to and/or remove asbestos-cement pipe on this project. There are special requirements for performing this work in accordance with OSHA and other federal and state standards. Please refer to specifications section number 02111 or 02112 for requirements for performing this work.

3.15 MASSACHUSETTS DATA SECURITY REGULATIONS:

The Contractor is required to comply with data security regulations contained in 201 CMR 17.00 that have been established to safeguard personal information of Massachusetts residents contained in paper or electronic records. The Contractor shall not submit to the Engineer or Owner documents in paper or electronic form that contain personal information (person's name combined with one or more of the following – Social Security Number, driver's license number or state-issued identification card number, financial institution account number, or credit or debit card number). Any document submitted to the Engineer that violates this provision shall be returned to the Contractor and the Contractor shall remove personal information from the document prior to resubmitting it to the Engineer. The Contractor shall require each Subcontractor to also comply with the MA data security regulations insofar as they involve submittal of personal information to the Engineer and Owner.

3.16 MWRA PROJECT INSPECTION:

The Contractor shall make the project site and all project records available to MWRA staff for review during the course of the project. MWRA staff will periodically monitor the progress of work to insure that the project is: (1) proceeding substantially as defined in the Scope of Work / Project Schedule sections of the executed Financial Assistance Agreement; and (2) proceeding in a manner which will produce the quantitative I/I reduction result which the community estimated would be achieved in the executed Financial Assistance Application.

3.17 MWRA AUDIT PROVISIONS:

The community, the community's engineer(s), and the community's contractor(s) shall maintain books, records, documents, and other evidence directly related to the performance on all work receiving funding under the executed Financial Assistance Agreement in accordance with generally accepted professional practice and appropriate accounting procedures and practices. The community, the community's engineer(s), and the community's contractor(s) shall also maintain the financial information and data used by the engineer(s) and contractor(s) in the preparation or support of project invoices.

and associated progress reports.

The MWRA and any other duly authorized person shall have access to such books, records, documents, and other evidence for inspection, audit, and copying. The community, the community's engineer(s), and the community's contractor(s), shall provide proper facilities for such access and inspection. All documents shall be kept for at least seven (7) years after the final payment to the engineer(s) or contractor(s), or at least seven (7) years after closeout of the project, whichever is later.

### 3.18 ABUTTER NOTIFICATION

The contractor shall produce and distribute door-to door abutter notification letters at least two (2) working days prior to all work items. Notification language shall be approved by the Owner prior to distribution.

### END OF SECTION

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## SECTION 01250

### PRICE ADJUSTMENTS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. Price adjustments, as required by MGL Chapter 30, Section 38A, shall be implemented for this Project. Price adjustments, as enumerated in Part 3 of this specification, shall be made for the following items:

##### Water and Sewer Projects

- Diesel fuel and gasoline
- Liquid asphalt
- Portland cement contained in cast-in-place concrete

##### Road and Bridge Projects

- Diesel fuel and gasoline
- Asphalt
- Concrete
- Steel

- B. Price adjustments shall be made in accordance with the methodology adopted by the Massachusetts Department of Transportation (MassDOT) in the following SPECIAL PROVISIONS documents, which are attached, but modified as contained herein:
1. Document 00811 Monthly Price Adjustment for Hot Mix Asphalt Mixtures, revised July 8, 2016
  2. Document 00812 Monthly Price Adjustment for Diesel fuel and Gasoline, revised January 26, 2009
  3. Document 00813 Price Adjustments for Structural Steel and Reinforcing Steel for Contracts Bid on or After April 5, 2011, dated December 12, 2016
  4. Document 00814 Price Adjustments for Portland Cement concrete Mixes, dated January 12, 2009
- C. Base and Period Prices used to calculate price adjustments shall be as published by the Massachusetts Department of Transportation as presented in Documents 00811 through 00814.
- D. No price adjustments will be allowed beyond the completion date of the contract, unless there is an approved extension of time.

## 1.02 PRICE ADJUSTMENTS:

- A. Price adjustments will only be made if the variance between the Base Price and the Period Price is Five Percent (5%) or more. For example, if the Base Price is \$3.15, and the Period Price is \$3.28, a price adjustment will not be made because the variance between the Base Price and the Period Price would only be 4.13%  $[(\$3.28 - \$3.15)/\$3.15]$ .
- B. In the instance where the Period Price is above the Base Price, and by 5% or more, the Contractor shall be entitled a price adjustment. For example, if the Base Price is \$3.15, and the Period Price is \$3.34, a price adjustment would be made because the variance between the Base price and the Period Price would be 6.03%  $[(\$3.34 - \$3.15)/\$3.15]$ . See Attachment A for example price adjustment calculations.
- C. In the instance where the Period Price is below the Base Price, and by 5% or more, the Contractor shall credit the Owner the adjustment. For example, if the Base Price is \$3.15, and the Period Price is \$2.90, a price adjustment (credit to the Owner) would be made because the variance between the Base price and the Period Price would be negative 7.94%  $[(\$2.90 - \$3.15)/\$3.15]$ .

## PART 2 - PRODUCTS

Not used

## PART 3 - EXECUTION

### 3.01 DIESEL FUEL AND GASOLINE:

- A. Price adjustments shall be determined based on documented quantities of diesel fuel and gasoline usage for site-dedicated equipment. This methodology shall replace the price adjustment basis on fuel usage factors, as described within the Massachusetts Department of Transportation Document 00812.
- B. Diesel Fuel and Gasoline price adjustments will apply only to Excavation and Borrow Work and Surfacing Work (all items containing Hot Mix Asphalt). All site-dedicated equipment shall be approved by the Engineer for the calculation of any qualifying price adjustment. Prior to the start of work the Contractor shall submit to the Engineer a list of all dedicated equipment for the project. The Contractor shall forward updated submittals, as necessary, throughout the duration of the contract. Only that equipment included within the current approved list shall be considered eligible for calculating a price adjustment under this Section 01250.
- C. The Contractor shall submit fuel delivery slips to the Engineer as a basis for calculating total diesel fuel and gasoline usage for site-dedicated equipment. At a minimum, the delivery slips will include the name of the fuel delivery company, the date and location of fueling, the type of fuel, description of the fueled equipment and the quantity for each type of fuel delivered in gallons. Any slips not providing the minimum information

shall not be included in the calculation of total diesel fuel and gasoline usage for price adjustment purposes.

- D. The Excavation and Borrow Work fuel factors shall be 0.29 Gallons per Cubic Yard of excavation (within the payment limits) for Diesel and 0.15 Gallons per Cubic Yard of excavation (within the payment limits) for Gasoline.
- E. The Surfacing Work fuel factor shall be 2.90 Gallons per Ton of Hot Mix Asphalt. For bid items involving asphalt paving that are measured and paid on a linear foot basis, cubic yard, or some other basis besides tonnage, the number of tons shall be determined by the Engineer by calculating tonnage of Hot Mix Asphalt within the established payment limits assuming a density of 150 pounds per cubic foot.
- F. A Surfacing Work Gasoline fuel factor does not apply.
- G. The Excavation and Borrow Work Diesel Fuel and Gasoline price adjustments will be determined by multiplying the number of Cubic Yards of excavation (within the payment limits) during the month by the fuel factor times the variance in price between Base Price and Period Price of the fuel.
- H. The Surfacing Work Diesel Fuel price adjustment will be determined by multiplying the number of Tons of Hot Mix Asphalt placed (within the payment limits) during the month by the fuel factor times the variance in price between Base Price and Period Price of the Diesel.
- I. The Base Price for Diesel Fuel on this project is a fixed price that was obtained from MassDOT as described in MassDOT Document 00812. The Base Price for Diesel Fuel is \$2.534 per Gallon.
- J. The Base Price for Gasoline on this project is a fixed price that was obtained from MassDOT as described in MassDOT Document 00812. The Base Price for Gasoline is \$2.336 per Gallon.

### 3.02 LIQUID ASPHALT:

- A. MassDOT Document 00811 shall be used as a basis to determine Liquid Asphalt price adjustments. The "New Asphalt Period Price Method" shall be used. For projects utilizing reclaimed asphalt include Reclaimed Asphalt Pavement (RAP) Factor (0.0 to <1.0) in calculation of the total price adjustment. Otherwise, use RAP Factor = 1.0.
- B. For bid items involving asphalt paving that are measured and paid on a linear foot basis, or some other basis besides tonnage, the number of tons shall be determined by the Engineer using compacted measure of thickness within the established payment limits.
- C. The Liquid Asphalt content of the Hot Mix Asphalt Mixture shall be 5.5% (0.055) by weight regardless of percentages established by the Job Mix Formula.



- D. The price adjustment will be determined by multiplying the number of tons of Hot Mix Asphalt placed (within the payment limits) during the month by the Liquid Asphalt content percentage (0.055) times the variance in price between Base Price and Period Price of Liquid Asphalt.
- E. The Base Price of Liquid Asphalt on this project is a fixed price that was obtained from MassDOT as described in MassDOT Document 00811. The Base Price for Liquid Asphalt is \$485.00 per Ton.
- F. Asphalt paving not separately measured for payment but rather included as an incidental component of work under a related bid item shall not be considered for price adjustment.

3.03 STRUCTURAL AND REINFORCING STEEL:

- A. MassDOT Document 00813 shall be used as a basis to determine Structural and Reinforcing Steel price adjustments.
- B. Steel price adjustments shall not be made for water and sewer projects.
- C. Period prices for steel are subject to change up to four (4) months after the date of original publication. Therefore, no price adjustment will be made until the index for the period is finalized.

3.04 PORTLAND CEMENT AND CONCRETE:

- A. MassDOT Document 00814 shall be used as a basis to determine Portland Cement and Concrete price adjustments.
- B. The price adjustment applies to all projects contained herein in Section 1.01A.
- C. Field Concrete used in water and sewer projects, typically used for thrust blocks and concrete encasement, shall not be considered for price adjustment. Cast-in-place concrete used on these projects will be included in the price adjustment determination.

END OF SECTION

ATTACHMENT FOR SECTION 01250 PRICE ADJUSTMENTS

MASSDOT DOCUMENTS 00811-00814

DOCUMENT 00811  
SPECIAL PROVISIONS  
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES  
ENGLISH AND METRIC UNITS  
Revised: 07/08/2016

This provision applies to all projects using greater than 100 tons (91 megagrams) of hot mix asphalt (HMA) mixtures containing liquid asphalt cement as stipulated in the Notice to Contractors section of the bid documents.

Price Adjustments will be based on the variance in price, for the liquid asphalt component only, between the Base Price and the Period Price. They shall not include transportation or other charges. Price Adjustments will occur on a monthly basis.

**Base Price**

The Base Price of liquid asphalt on a project as listed in the Notice to Contractors section of the bid documents is a fixed price determined by the Department at the time of the bid using the same method as the determination of the Period Price detailed below. The Base Price shall be used in all bids.

**Period Price**

The Period Price is the price of liquid asphalt for each monthly period as determined by the Department using the average selling price per standard ton of PG64-28 paving grade (primary binder classification) asphalt, FOB manufacturer's terminal, as listed under the "East Coast Market - New England, Boston, Massachusetts area" section of the Poten & Partners, Inc. "Asphalt Weekly Monitor". This average selling price is listed in the issue having a publication date of the second Friday of the month and will be posted as the Period Price for that month. The Department will post this Period Price on its website at <http://www.mhd.state.ma.us/> within two (2) business days following its receipt of the relevant issue of the "Asphalt Weekly Monitor". Poten and Partners has granted the Department the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor. This method of period price determination was formerly called the New Asphalt Period Price Method. Separate website postings using both the New Asphalt Period Price Method and the Old Asphalt Period Price Method were discontinued after June 2013.

**Price Adjustment Determination, Calculation and Payment**

The Contract Price of the HMA mixture will be paid under the respective item in the Contract. Price Adjustments, as herein provided, either upwards or downwards, will be made after the work has been performed using the monthly period price for the month during which the work was performed.

Price Adjustments will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M3.11.03.

Price Adjustments will be separate payment items. The pay item numbers are 999.401 for a positive price adjustment (a payment) and 999.402 for a negative price adjustment (a deduction). Price Adjustments will be calculated using the following equation:

Price Adjustment = Tons of HMA Placed X Liquid Asphalt Content % X RAP Factor X (Period Price - Base Price)

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

\*\*\*\*\* END OF DOCUMENT \*\*\*\*\*

DOCUMENT 00812

SPECIAL PROVISIONS  
MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE –  
ENGLISH UNITS

Revised: 01/26/2009

This monthly fuel price adjustment is inserted in this contract because the national and worldwide energy situation has made the future cost of fuel unpredictable. This adjustment will provide for either additional compensation to the Contractor or repayment to the Commonwealth, depending on an increase or decrease in the average price of diesel fuel or gasoline.

This adjustment will be based on fuel usage factors for various items of work developed by the Highway Research Board in Circular 158, dated July 1974. These factors will be multiplied by the quantities of work done in each item during each monthly period and further multiplied by the variance in price from the Base Price to the Period Price.

The Base Price of Diesel Fuel and Gasoline will be the price as indicated in the Department's web site ([www.mhd.state.ma.us](http://www.mhd.state.ma.us)) for the month in which the contract was bid, which includes State Tax.

The Period Price will be the average of prices charged to the State, including State Tax for the bulk purchases made during each month.

This adjustment will be effected only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No adjustment will be paid for work done beyond the extended completion date of any contract.

Any adjustment (increase or decrease) to estimated quantities made to each item at the time of final payment will have the fuel price adjustment figured at the average period price for the entire term of the project for the difference of quantity.

The fuel price adjustment will apply only to the following items of work at the fuel factors shown:

ITEMS COVERED	FUEL FACTORS	
	Diesel	Gasoline
Excavation: and Borrow Work: Items 120, 120.1, 121, 123, 124, 125, 127, 129.3, 140, 140.1, 141, 142, 143, 144., 150, 150.1, 151 and 151.1 (Both Factors used)	0.29 Gallons / CY.	0.15 Gallons / CY
Surfacing Work: All Items containing Hot Mix Asphalt	2.90 Gallons / Ton	Does Not Apply

\*\*\*\*\* END OF DOCUMENT \*\*\*\*\*



MassDOT Highway Division

DOCUMENT 00813

SPECIAL PROVISIONS

PRICE ADJUSTMENTS FOR STRUCTURAL STEEL AND REINFORCING STEEL

FOR CONTRACTS BID ON OR AFTER APRIL 5, 2011

ENGLISH UNITS

December 12, 2016

This provision applies to projects containing a price adjustment for structural steel and reinforcing steel as stipulated in the Notice to Contractors section of the Bid Documents. It applies to all structural steel as defined below and all reinforcing steel on the project. Compliance with this provision is mandatory, i.e., there are no “opt-in” or “opt-out” clauses. Price adjustments will be handled as described below and shall only apply to unfabricated structural steel material, consisting of rolled shapes, plate steel, sheet piling, pipe piles, steel castings and steel forgings, and unfabricated reinforcing steel bars.

Price adjustments will be variances between Base Prices and Period Prices. Base Prices and Period Prices are defined below.

Price adjustments will only be made if the variances between Base Prices and Period Prices are 5% or more. A variance can result in the Period Price being either higher or lower than the Base Price. Once the 5% threshold has been achieved, the adjustment will apply to the full variance between the Base Price and the Period Price.

Price adjustments will be calculated by multiplying the number of pounds of unfabricated structural steel material or unfabricated reinforcing steel bars subject to a price adjustment by the index factor calculated as shown below under Example of a Period Price Calculation.

Price adjustments will not include the costs of shop drawing preparation, handling, fabrication, coatings, transportation, storage, installation, profit, overhead, fuel costs, fuel surcharges, or other such charges not related to the cost of the unfabricated structural steel and unfabricated reinforcing steel.

The weight of steel subject to a price adjustment shall not exceed the final shipping weight of the fabricated part by more than 10%.

Base Prices and Period Prices are defined as follows:

Base Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are fixed prices determined by the Department and found in the Notice to Contractors section of the Bid Documents.

The Base Price Date is the month and year in which MassDOT opened bids for the project. This date is used to select the Base Price Index.

Period Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are variable prices calculated based on the purchase date of the steel (Period Price Date) using an index of steel prices to adjust the Base Price.

The Period Price Date is the date the steel was delivered to the fabricator as evidenced by an official bill of lading submitted to the Department containing a description of the shipped materials, weights of the shipped materials and the date of shipment. This date is used to select the Period Price Index.

The index used for the calculation of Period Prices is the U.S. Bureau of Labor Statistics (BLS) Producer Price Index (PPI) Series ID WPU101702 (Not Seasonally Adjusted, Group: Metals and Metal Products, Item: Semi-finished Steel Mill Products.) As this index is subject to revision for a period of up to four (4) months after its original publication, no price adjustments will be made until the index for the period is finalized, i.e., the index is no longer suffixed with a "(P)".

Period Prices are determined as follows:

Period Price = Base Price X Index Factor

Index Factor = Period Price Index / Base Price Index

Example of a Period Price Calculation:

Calculate the Period Price for December 2009 using a Base Price from March 2009 of \$0.82/Pound for 1,000 Pounds of ASTM A709 (AASHTO M270) Grade A36 Structural Steel Plate.

The Period Price Date is December 2009. From the PPI website\*, the Period Price Index = 218.0.

The Base Price Date is March 2009. From the PPI website\*, the Base Price Index = 229.4.

Index Factor = Period Price Index / Base Price Index =  $218.0 / 229.4 = 0.950$

Period Price = Base Price X Index Factor =  $\$0.82/\text{Pound} \times 0.950 = \$0.78/\text{Pound}$

Since  $\$0.82 - \$0.78 = \$0.04$  is less than 5% of \$0.82, no price adjustment is required.



If the \$0.04 difference shown above was greater than 5% of the Base Price, then the price adjustment would be 1,000 Pounds X \$0.04/Pound = \$40.00. Since the Period Price of \$0.78/Pound is less than the Base Price of \$0.82/Pound, indicating a drop in the price of steel between the bid and the delivery of material, a credit of \$40.00 would be owed to MassDOT. When the Period Price is higher than the Base Price, the price adjustment is owed to the Contractor.

\* To access the PPI website and obtain a Base Price Index or a Period Price Index, go to <http://data.bls.gov/cgi-bin/srgate>

END OF EXAMPLE.

The Contractor will be paid for unfabricated structural steel and unfabricated reinforcing steel under the respective contract pay items for all components constructed of either structural steel or reinforced Portland cement concrete under their respective Contract Pay Items.

Price adjustments, as herein provided for, will be paid separately as follows:

Structural Steel

Pay Item Number 999.449 for positive (+) pay adjustments (payments to the Contractor)

Pay Item Number 999.457 for negative (-) pay adjustments (credits to MassDOT Highway Division)

Reinforcing Steel

Pay Item Number 999.466 for positive (+) pay adjustments (payments to the Contractor)

Pay Item Number 999.467 for negative (-) pay adjustments (credits to MassDOT Highway Division)

No price adjustment will be made for price changes after the Contract Completion Date, unless the MassDOT Highway Division has approved an extension of Contract Time for the Contract.

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END OF DOCUMENT

DOCUMENT 00814

SPECIAL PROVISIONS  
PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES

January 12, 2009

This provision applies to all projects using greater than 100 Cubic Yards (76 Cubic Meters) of Portland cement concrete containing Portland cement as stipulated in the Notice to Contractors section of the Bid Documents. This Price Adjustment will occur on a monthly basis.

The Price Adjustment will be based on the variance in price for the Portland cement component only from the Base Price to the Period Price. It shall not include transportation or other charges.

The Base Price of Portland cement on a project is a fixed price determined at the time of bid by the Department by using the same method as for the determination of the Period Price (see below) and found in the Notice to Contractors.

The Period Price of Portland cement will be determined by using the latest published price, in dollars per ton (U.S.), for Portland cement (Type I) quoted for Boston, U.S.A. in the **Construction Economics** section of *ENR Engineering News-Record* magazine or at the ENR website <http://www.enr.com> under **Construction Economics**. The Period Price will be posted on the MassHighway website the Wednesday immediately following the publishing of the monthly price in ENR, which is normally the first week of the month.

The Contract Price of the Portland cement concrete mix will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

The price adjustment applies only to the actual Portland cement content in the mix placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M4.02.01. No adjustments will be made for any cement replacement materials such as fly ash or ground granulated blast furnace slag.

The Price Adjustment will be a separate payment item. It will be determined by multiplying the number of cubic yards of Portland cement concrete placed during each monthly period times the Portland cement content percentage times the variance in price between the Base Price and Period Price of Portland cement.

This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

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END OF DOCUMENT



## SECTION 01270

### MEASUREMENT AND PAYMENT

#### PART 1 - DESCRIPTION

##### 1.01 GENERAL:

- A. The following subsections describe the measurement of and payment for the work to be done under the items listed in Section 00410, FORM OF GENERAL BID.
- B. All work performed as described in these contract documents will be paid for under one or more of the items listed in the FORM OF GENERAL BID. All other activities required in connection with performance of the work, including all work required under Division 1, GENERAL REQUIREMENTS, whether described in the contract documents or mandated by applicable codes, permits and laws, will not be separately paid for unless specifically provided for in the form of general bid, but will be considered incidental to performance of the overall project.
- C. Each unit or lump-sum price stated in the FORM OF GENERAL BID shall constitute full compensation as herein specified for each item of work completed in accordance with the drawings and specifications, including cleanup.
- D. The payment items listed herein and in the FORM OF GENERAL BID are intended to provide full payment for the work shown on the drawings and specified herein. Any work called for or implied in the documents but not listed as a payment item shall be considered incidental to the overall project.
- E. Unless otherwise noted, each item shall be furnished and installed in accordance with the technical section whether a specific applicable payment item exists or not.
- F. Unless otherwise noted, all earthwork shall be included under any item requiring excavation. The prices for those items that involve excavation shall include compensation for disposal of surplus excavated material, and installation of all necessary sheeting and bracing.
- G. In all items involving excavation, the price shall be based on doing the entire excavation in earth. Where rock is excavated, the price therefore shall be in addition to the cost of excavating earth and no deduction shall be made in the amount for earth excavation.
- H. The price for all pipe items for sewers, wyes, tees, building connections, service connections, and other pipelines shall constitute full compensation for furnishing, laying, jointing, and testing pipe; earth excavation and backfill; dewatering; crushed stone bedding; sidewalk replacement; curbing replacement; loaming and seeding and cleaning up.

1.02 SEWER SIPHON COMPLETE IN PLACE:

A. PIPE BURSTING OF EXISTING SEWER:

1. The lump sum price for this item shall constitute full compensation for pipe bursting of dual 8-inch cast iron sewer siphon pipes as specified on Sheet C-1.
2. All materials, labor, tools, and equipment shall be considered incidental to the work and shall not be measured separately for payment. Pipe bursting shall be performed as specified in Section 02225, PIPE BURSTING CONSTRUCTION.
3. The lump sum price of this item shall also include excavation for access pits, protection of existing utilities, controlled density fill (CDF), bedding, select material, and all work incidental thereto.
4. Cleaning and television inspection of existing pipes shall also be considered incidental to the work and shall not be measured separately for payment.
5. The work shall be paid for at the lump sum price under Item 1a.

B. DIRECT BURY OF HDPE PIPE THROUGH PIPE BURSTING:

1. The work of this item shall be measured at the unit price bid per linear foot of HDPE pipe installed as replacement and extension of the Mystic Street sewer siphon pipes. Linear footage to be paid for under this item shall be measured along the centerline of each siphon barrel completed in place, from the final location of the new upstream siphon chamber to the final location of the new downstream siphon chamber, completed pipe edge to completed pipe edge.
2. Measurement, including all material, labor, tools, and equipment, excavation, protection of existing utilities, controlled density fill (CDF), backfill, bedding, select material, a shall be based on the actual length of pipes installed as determined by the Engineer.
3. Pipe fusion joining for pipe bursting operations and extension of the HDPE pipe to meet new siphon structures shall be considered incidental to the work and shall not be measured separately for payment
4. Cleaning, television inspection, and testing of replaced pipes shall be considered incidental to the work and shall not be measured separately for payment.
5. The work shall be paid for at the contract unit price under Item 1b.

1.03 SEWERS COMPLETE IN PLACE:

A. POLYVINYL CHLORIDE (PVC) SEWERS:

1. The length of sewers to be paid for under the appropriate subdivisions of this item shall be measured by the linear foot along the completed sewers, including wyes and tees, of actual sewers installed. In locations where a sewer service is being replaced and the mainline sewer is not being replaced, replacement of mainline sewer connected to the wye or tee, as described in specification Section 02442; 3.02, 5, shall be considered incidental to the work and shall not be measured separately for payment.
2. The unit prices under the appropriate subdivisions of this item shall constitute full compensation for constructing the sewers, complete in place, as indicated on the drawings and as specified, including removal and disposal of existing sewers where necessary, furnishing and installing wyes, tees, pipe and fittings, drop connections, making connections to the existing sewer, excavation, protection of existing utilities, backfill, controlled density fill (CDF), bedding, select material, clearing, grubbing, testing, removal and replacement of sidewalks and curbing, post repair television inspection, and all work incidental thereto and not specifically included for payment under other items, as described in Section 02442, POINT REPAIR OF GRAVITY SEWERS (OPEN CUT).
3. The work under this section shall be paid at the contract unit price under Items 2a and 10a.

1.04 SEWER BYPASS SYSTEM:

A. FURNISH AND INSTALL SEWER BYPASS SYSTEM:

1. The lump sum price for this item shall constitute full compensation for furnishing and installing, operating, and maintaining the temporary bypass complete in place as specified, including furnishing and installing all pipe, tapping sleeves, couplings, fittings, joint restraints, excavation, burial of the bypass at all paved crossings, driveway crossings, sidewalk crossings, and walkway crossings, backfill, bedding, select material, testing, removal and replacement of sidewalks and curbing, pavement replacement, pipe protection, fuel charges, and all work incidental thereto and not specifically included for payment under other items.
2. The lump sum price for this item shall also include the work required to remove and dispose of bypass following completion of construction.
3. The cost of temporary pavement and permanent pavement related to the Temporary Sewer Bypass System shall be considered incidental to the work and shall not be measured separately for payment.

4. The cost of replacing sidewalks (including handicap sidewalk ramps) and pavement related to the Temporary Sewer Bypass System shall be considered incidental to the work and shall not be measured separately for payment.
5. The work under this section shall be paid at the contract price under Item 3a, "Sewer bypass system for siphon replacement".

1.05 SEWER MANHOLES AND APPURTENANCES (BASE BID):

- A. Unless otherwise provided for, the work shall be measured per unit of completed work under the appropriate subdivisions of the item "Sewer Manholes and Appurtenances (Base Bid)."
- B. UPSTREAM SIPHON STRUCTURE MA121:

1. The lump sum price for the proposed upstream siphon structure MA121 item shall include excavation, protection of existing utilities, crushed stone bedding, and backfill; controlled density fill (CDF); surface restoration; furnishing and installing precast concrete base, wall sections, risers, top section, and weir wall with two (2) 10-inch penetrations as specified on Sheet D-3, gaskets, sealants, bricks, grout, connections and couplings; and all incidental work necessary to complete the precast concrete structure as shown on the drawings and as specified herein.
2. The lump sum price for this item shall also include furnishing and installing the two (2) frames and covers and grouting the frames to the brick courses.
3. The lump sum price for this item shall also include furnishing and installing a maximum of five (5) linear feet of 15" PVC pipe and appropriate coupling for connection to the existing 15" gravity main incoming to the sewer siphon structure. PVC pipe shall be installed in accordance with Section 02442, POINT REPAIR OF GRAVITY SEWERS (OPEN CUT).
4. The work under this item for the upstream siphon structure, MA121, shall be paid at the lump sum price under Item 4a, "Precast concrete siphon chamber with frames and covers, 8.0 ft. x 4.0 ft."

C. DOWNSTREAM SIPHON STRUCTURE MA120

1. BASE, FRAME and COVER:
  - a. Base, frame, and cover shall be measured per set installed in place and shall be paid under the item "Precast concrete siphon chamber base with frame and cover, 5.0 ft. diameter."

- b. The unit price for these items shall include excavation, protection of existing utilities, crushed stone bedding, and backfill; controlled density fill (CDF); surface restoration; furnishing and installing base, steps, gaskets, sealants, connections and couplings; and all incidental work necessary to complete the precast concrete base as shown on the drawings and as specified herein.
- c. The unit price for these items shall also include furnishing and installing the frame and cover and grouting the frame to the brick courses.
- d. The unit price for these items shall also include furnishing and installing a maximum of five (5) linear feet of 15" PVC pipe and appropriate coupling for connection to the existing 15" gravity main outgoing from the sewer siphon structures. PVC pipe shall be installed in accordance with Section 02442, POINT REPAIR OF GRAVITY SEWERS (OPEN CUT).
- e. The work under this item for the downstream siphon manhole, MA120 (5 ft. diameter), shall be paid at the contract unit price under Item 4b.

2. WALLS AND CONE:

- a. Precast concrete structure walls and cone shall be measured per vertical foot installed in place. Measurement shall be based on the vertical distance from the internal base to the top of the completed frame at finished grade.
- b. Walls and cone shall be paid at the contract unit prices under the item "Precast concrete siphon chamber walls and cone, 5.0 ft. diameter." The unit price for this item shall include excavation and backfill; protection of existing utilities; controlled density fill (CDF); surface restoration; furnishing and installing walls, cones, risers, gaskets, seals, steps, bricks and grout to grade; and all incidentals necessary to complete the precast concrete walls and cones as shown on the drawings and specified herein.
- c. The work under this item for the downstream siphon manhole, MA120 (5 ft. diameter), shall be paid at the contract unit price under Item 4c.

D. CONNECTIONS TO EXISTING STRUCTURES:

Connections to existing structures shall be considered incidental to the work and shall not be measured separately for payment.

E. FIELD TESTING/INSPECTION:

All inspecting, testing, and reworking within the warranty period shall be considered incidental to the work and shall not be measured separately for payment.

F. REMOVAL AND DISPOSAL OF EXISTING SIPHON STRUCTURES:

1. Removal and disposal of existing siphon structures shall be measured per structure removed and disposed of.
2. The unit price for this item shall include removal and disposal of existing siphon structures where necessary, including all material, labor, tools, and equipment; excavation; protection of existing utilities; surface restoration; abandonment of existing sewers as specified on the Drawings; proper removal and disposal of sanitary sewer grit and solids; and all incidental work necessary to remove and dispose of existing siphon structures as shown on the drawings and as specified herein.
  - a. Upon removal and disposal of the existing upstream siphon manhole MA121, the 6-inch service connection shall be abandoned in place by means of controlled density fill (CDF) and a cap at each end, as described in Section 02222, ABANDONMENT OF SEWERS. This work shall be incidental and shall not be measured separately for payment.
  - b. Upon removal and disposal of the existing downstream siphon manhole MA120, the 12-inch overflow pipe shall be abandoned in place by means of a cap in the vicinity of the open trench, prior to any backfilling. This work shall be incidental and shall not be measured separately for payment.
3. The work under this item shall be paid at the contract unit price under Item 4d.

1.06 ROCK EXCAVATION AND DISPOSAL:

- A. The cost of pre-blast surveys, vibration air blast monitoring, blasting records and post-blast inspection shall be considered incidental to the cost of rock excavation and disposal and will not be separately paid.
- B. Rock excavated and disposed of off-site by the Contractor shall be measured by the cubic yard, within the limits of excavation as defined in Paragraph C below. The unit price established by the Engineer under Items 5a and 13a is the minimum unit price to be used for rock excavation. The unit price to be inserted by the Contractor in his bid under Items 5b and 13b are intended to reflect the Contractor's additional costs for performing the rock excavation, should he decide that the minimum unit prices in Items 5a and 13a are insufficient compensation.
- C. Payment limits for rock excavation in trenches containing one pipe shall be as defined on the drawings. When two or more pipes are installed parallel to one another and the trench payment limits overlap, rock excavation in the overlap section will only be paid once.

- D. Where rock is encountered, it shall be uncovered but not excavated until measurements have been made by the Engineer, unless in the opinion of the Engineer, satisfactory measurements can be made in some other manner.
- E. Payment for this item includes rock excavation and disposal, furnishing and installing gravel borrow in its place, and providing all required documentation.
- F. The bidder should include in his bid for items involving excavation, the cost of doing the entire excavation as earth, the price for the Item "Rock Excavation and Disposal" being intended to cover the difference between the cost of rock excavation and the cost of earth excavation. The price for this item shall be paid in addition to any payment made for earth excavation.
- G. For all manholes and structures, measurement will be to one foot outside the widest dimension of the structure or shall be the maximum connecting trench width, whichever is greater. No allowance will be made for over-breakage.

1.07 TEST PITS:

- 1. Test pits as ordered by the Engineer and not incidental to construction shall be measured per cubic yard excavated and backfilled under the Item "Test Pits."
- 2. Test pits shall be paid at the contract unit price under the item "Test Pits." The unit price under this item shall constitute full compensation for all excavation, backfill, pavement repair, surface restoration, or other work incidental to excavation or restoration of test pits.
- 3. The work under this item shall be paid at the contract unit price under Items 6a and 14a.

1.08 ADDITIONAL CRUSHED STONE:

- 1. Additional crushed stone ordered by the Engineer shall be measured in place per cubic yard installed.
- 2. Additional crushed stone shall be paid at the contract price for work completed and shall constitute full compensation for furnishing and placing crushed stone.
- 3. The work under this item shall be paid at the contract unit price under Items 6b and 14b.

1.09 ADDITIONAL GRAVEL:

- 1. Additional gravel ordered by the Engineer shall be measured in place per cubic yard installed.

2. Additional gravel shall be paid at the contract price for work completed and shall constitute full compensation for furnishing and placing crushed stone.
3. The work under this shall be paid at the contract unit price under Items 6c and 14c.

1.10 ADDITIONAL CONTROLLED DENSITY FILL (CDF):

1. Additional CDF ordered by the Engineer shall be measured in place per cubic yard installed.
2. Additional CDF shall be paid at the contract price for work completed and shall constitute full compensation for furnishing and placing CDF.
3. The work under this shall be paid at the contract unit price under Item 6d.

1.11 PAVEMENT REPLACEMENT:

A. BITUMINOUS PAVEMENT:

1. Bituminous pavement shall be measured per linear foot, square footage, or ton of work completed and shall be paid at the contract unit prices under the subdivisions of the item "Pavement Replacement" as further described below.
2. Pavement disturbed by the Contractor's operations outside of payment limits shall be repaired to its original condition by the Contractor at no additional cost to the Owner.
3. Items measured per linear foot shall be measured along the centerline of the completed pipeline trench.
4. Type B - Temporary Pavement Binder Course:

Temporary pavement binder course shall be measured per square foot and shall include removal of temporary paving, furnishing, preparation and installation of 12-inch depth of compacted gravel borrow sub base, and permanent pavement binder course (trench width) as shown on the drawings and as specified.

5. Type B - Temporary Pavement Top Course:

Temporary top course pavement shall be measured per square foot and shall include payment for leveling course, keyways, and joint sealant as shown on the drawings.



6. Type A - Temporary Pavement (Trench Width):

Temporary pavement (trench width) shall be measured per linear foot and shall include furnishing, preparation and installation of 14-inch depth of compacted gravel borrow sub base, and temporary pavement (trench width) as specified. Maintenance and repair of temporary pavement (trench width) shall also be included.

7. Type A - Permanent Pavement Binder Course (Trench Width):

Permanent pavement binder course (trench width) shall be measured per linear foot and shall include removal of temporary paving, furnishing, preparation and installation of 12-inch depth of compacted gravel borrow sub base, and permanent pavement binder course (trench width) as shown on the drawings and as specified.

8. Type A - Permanent Pavement Top Course (Trench Width):

Permanent top course pavement (trench width) shall be measured per linear foot and shall include payment for leveling course, keyways, and joint sealant as shown on the drawings.

9. Additional Pavement:

- a. Additional pavement beyond the payment limits of the trench shall be measured per ton for payment at the unit price, where ordered by the Engineer and not included for payment under other items.
- b. Payment for additional pavement shall include furnishing, preparation and installation of the additional pavement ordered by the Engineer, outside of the normal trench limits.

10. Raising and adjusting of new and existing castings shall be incidental to pavement replacement and not included separately for payment. Castings belonging to private utilities shall be raised by their own forces at their expense.

11. Except as otherwise indicated, repainting of traffic markings for top course shall be included in the payment for this item. Provision of stop bars, traffic arrows, printed words, and lane striping dividers shall also be included in payment for top course.

12. Type B pavement replacement shall be paid at the contract unit price under Items 7a, 7b, and 7c. Type A pavement replacement shall be paid at the contract unit price under Items 15a, 15b, 15c, and 15d.

1.12 WATER AND DRAIN RECONSTRUCTION:

- A. Reconstruction of water mains, water service connections, and drains shall be measured per water main, water service connection, or drain reconstructed and shall be paid at the contract unit price under Items 8a and 16a.
- B. Only pipe which is not shown on the drawings or not located for the Contractor in the field shall be considered for payment.
- C. Pipes damaged by the Contractor which pass below the proposed pipeline or are outside the specified trench limits shall be repaired by the Contractor at no cost to the Owner.

1.13 BUILDING CONNECTIONS SYSTEMS:

A. WYES AND TEES:

- 1. The unit price to be paid for under the appropriate subdivisions of this item shall be measured for payment per wye or tee installed within the main sewer.
- 2. The contract unit price under the appropriate sub-divisions of this item shall constitute full compensation for furnishing and installing wyes or tees in the main sewer, complete, as indicated on the drawings and/or specified, including all work incidental thereto and not specifically included for payment under other items. Installation of a wye or tee shall include a minimum of one (1) linear foot of mainline on either side of the new connection, and shall be considered incidental to the work and shall not be measured separately for payment.
- 3. The work under this section shall be paid at the contract unit price under Item 11a.

B. BUILDING CONNECTIONS:

- 1. The length of building connections to be paid for under the appropriate subdivisions of this item shall be measured per linear foot along the horizontal projection of the centerline of the completed building connection, from the centerline of the main sewer to the end of the building connection.
- 2. Building connections shall be paid at the contract unit price under the Item "6-inch PVC Building Connections." The unit price under this Item shall constitute full compensation for construction building connections, complete in place, as indicated on the Drawings and as specified, including removal and disposal of existing building connections where necessary, furnishing and installing pipe, fittings, detectable tracer tape, end plug, connections to the existing sewer, excavation, backfill, crushed stone, and select backfill, restoration of the ground surface, loaming and seeding, sidewalk and curb replacement, and incidentals necessary to construct the building connections as shown on the drawings and/or as specified.

3. The work under this section shall be paid at the contract unit price under Items 11b.

1.14 SEWER MANHOLES AND APPURTENANCES (ALTERNATE BID NO. 1):

- A. Unless otherwise provided for, the work shall be measured per unit of completed work under the appropriate subdivisions of the item "Sewer Manholes and Appurtenances (Alternate Bid No. 1)."

- B. BASES, FRAMES and COVERS:

1. Bases, frames, and covers shall be measured per set installed in place.
2. The unit price for this item shall include removal and disposal of existing manhole or lamphole where necessary, excavation, crushed stone bedding, and backfill; pavement replacement and surface restoration; furnishing and installing base, invert channels, steps, gaskets, sealants, connections and couplings; and all incidental work necessary to complete the precast concrete base as shown on the drawings and as specified herein.
3. The unit price for this item shall also include furnishing and installing the frame and cover, and grouting the frame to the brick courses.
4. The unit price for this item shall also include furnishing and installing a minimum of five (5) linear feet of PVC pipe for each connection to the new manhole. PVC pipe shall be installed in accordance with Section 02442, POINT REPAIR OF GRAVITY SEWERS (OPEN CUT).
5. The work under this item shall be paid at the contract unit price under Item 12a.

- C. WALLS AND CONES:

1. Precast concrete manhole walls and cones shall be measured per vertical foot installed in place. Measurement shall be based on the vertical distance from the invert of the pipeline to the top of the completed frame at finished grade.
2. Walls and cones shall be paid at the contract unit prices under the item "Precast Concrete Manhole Walls and Cones." The unit price for this item shall include excavation and backfill; pavement replacement and surface restoration; furnishing and installing walls, cones, gaskets, seals, steps, and bricks and grout to grade; and all incidentals necessary to complete the precast concrete walls and cones as shown on the drawings and specified herein.
3. The work under this item shall be paid at the contract unit price under Item 12b.

D. CONNECTIONS TO EXISTING STRUCTURES:

Connections to existing structures shall be considered incidental to the work and shall not be measured separately for payment.

E. FIELD TESTING/INSPECTION:

All inspecting, testing, and reworking within the warranty period shall be considered incidental to the work and shall not be measured separately for payment.

1.15 SEWER CHEMICAL ROOT TREATMENT:

A. GENERAL:

1. Chemical root treatment shall be measured at the unit price bid per linear foot of sewer treated.
2. Measurement shall be based on the actual length of treated sewer from center line of manhole to center line of manhole. Sewers shall be chemically treated for root control as specified in Section 02437, SEWER LINE CHEMICAL ROOT TREATMENT.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Items 17a, 29a, and 35a.

1.16 CURED-IN-PLACE PIPE:

A. GENERAL:

1. The work of this item shall be measured at the unit price bid per linear foot of lined pipe. Lined pipe shall be measured as the actual length of cured-in-place pipe installed and shall be the shortest distance from the inside edge of the inversion manhole to the inside edge of the tail manhole.
2. The contract unit price to be paid per linear foot of cured-in-place pipe installed shall constitute full compensation for supplying all material, labor, tools, and equipment to install cured-in-place pipe as specified in Section 02428, CURED-IN-PLACE PIPE.
3. Cleaning and television inspection prep work, prior to cured-in-place pipe installation, shall be considered incidental to the work and shall not be measured separately for payment.

4. Reinstating service connections shall be considered incidental to the work and shall not be measured separately for payment.
5. Bypass pumping and plugging or blocking of flow shall be considered incidental to the work and shall not be measured separately for payment.
6. Cleaning and television inspection of relined pipes shall be considered incidental to the work and shall not be measured separately for payment.
7. Capture and disposal of cure water shall be considered incidental to the work and shall not be measured separately for payment.
8. All cured-in-place pipes shall be designed by the Contractor in accordance with ASTM F1216 as described in Specification 02428, CURED-IN-PLACE PIPE.
9. The work shall be paid for at the contract unit price under Items 18a, 18b, 24a, 30a, and 36a.

**B. GROUT REINSTATED SERVICE CONNECTION IN CURED-IN-PLACE PIPE:**

1. The work of this item shall be measured per service connection grouted in cured-in-place pipe.
2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to TV inspect, and pressure test, and grout the service connection as specified in Section 02443, SERVICE CONNECTION REHABILITATION.
3. The work shall be paid for at the contract unit price under Item 18c, 24b, 30b, and 36b.

**C. Ten percent of the payment for the subdivisions of the item “Cured-in-place Pipe” shall be withheld until the pipeline rehabilitations have satisfactorily completed and passed field testing/inspection(s) as specified in Section 02428, CURED-IN-PLACE PIPE.**

**1.17 STRUCTURAL CURED-IN-PLACE PIPE:**

**A. GENERAL:**

1. The work of this item shall be measured at the unit price bid per linear foot of lined pipe. Lined pipe shall be measured as the actual length of structural cured-in-place pipe installed and shall be the shortest distance from the inside edge of the inversion manhole to the inside edge of the tail manhole.
2. The contract unit price to be paid per linear foot of structural cured-in-place pipe installed shall constitute full compensation for supplying all material, labor, tools,

and equipment to install cured-in-place pipe as specified in Section 02428, CURED-IN-PLACE PIPE.

3. Cleaning and television inspection prep work, prior to cured-in-place pipe installation, shall be considered incidental to the work and shall not be measured separately for payment.
4. Reinstating service connections shall be considered incidental to the work and shall not be measured separately for payment.
5. Bypass pumping and plugging or blocking of flow shall be considered incidental to the work and shall not be measured separately for payment.
6. Cleaning and television inspection of relined pipes shall be considered incidental to the work and shall not be measured separately for payment.
7. Capture and disposal of cure water shall be considered incidental to the work and shall not be measured separately for payment.
8. All cured-in-place pipes shall be designed by the Contractor in accordance with ASTM F1216 as described in Specification 02428, CURED-IN-PLACE PIPE.
9. The work shall be paid for at the contract unit price under Item 31a.

**B. GROUT REINSTATED SERVICE CONNECTION IN STRUCTURAL CURED-IN-PLACE PIPE:**

1. The work of this item shall be measured per service connection grouted in structural cured-in-place pipe.
2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to TV inspect, and pressure test, and grout the service connection as specified in Section 02443, SERVICE CONNECTION REHABILITATION.
3. The work shall be paid for at the contract unit price under Item 31b.

**C. Ten percent of the payment for the subdivisions of the item “Structural Cured-in-place Pipe” shall be withheld until the pipeline rehabilitations have satisfactorily completed and passed field testing/inspection(s) as specified in Section 02428, CURED-IN-PLACE PIPE.**

1.18 SERVICE CONNECTION REHABILITATION:

A. CUT PROTRUDING SERVICE CONNECTIONS:

1. The work of this item shall be measured per protruding service connection cut.
2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to cut the protruding service connection as specified in Section 02443, SERVICE CONNECTION REHABILITATION.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. Television inspection of cut service connections shall be considered incidental to the work and shall not be measured separately for payment.
5. The work shall be paid for at the contract unit price under Items 19a and 37a.

B. TV INSPECTION AND TESTING SERVICE CONNECTIONS:

1. The work of this item shall be measured per service connection TV inspected and pressure tested.
2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to TV inspect and pressure test the service connection as specified in Section 02443, SERVICE CONNECTION REHABILITATION.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work shall be paid for at the contract unit price under Item 25a.

C. GROUTING SERVICE CONNECTIONS AFTER TV INSPECTION:

1. The work of this item shall be measured per service connection grouted.
2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to grout the service connection if it fails the TV inspection and pressure testing procedure as specified in Section 02443, SERVICE CONNECTION REHABILITATION.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work shall be paid for at the contract unit price under Item 25b.

1.19 SEWER MANHOLE REHABILITATION:

A. CEMENTITIOUS LINING OF MANHOLES:

1. The work of this item shall be measured at the unit price bid per vertical foot of manhole actually lined, which shall be measured from top of manhole bench to bottom of manhole frame.
2. The contract unit price per vertical foot of manhole to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to line the manhole as specified in Section 02435, SEWER MANHOLE REHABILITATION. Cementitious lining includes invert sealing, exterior chemical grouting, and interior sealing.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Items 20a, 26a, 32a, and 38a.
5. Ten percent of the payment for this item shall be withheld until the manhole rehabilitations have been satisfactorily completed and passed field testing/inspection(s) as specified in Section 02435, SEWER MANHOLE REHABILITATION.

B. GROUT AND PATCH MANHOLES TO STOP LEAKS:

1. The work of this item shall be measured per manhole grouted and patched.
2. The contract unit price per manhole to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to grout and patch manholes as specified in Section 02435, SEWER MANHOLE REHABILITATION.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid for at the contract unit price under Items 20b and 32b.
5. Ten percent of the payment for this item shall be withheld until the manhole rehabilitations have been satisfactorily completed and passed field testing/inspection(s) as specified in Section 02435, SEWER MANHOLE REHABILITATION.



C. INSTALL MANHOLE INFLOW DISH:

1. The work of this item shall be measured per manhole inflow dish furnished and installed.
2. The contract unit price to be paid per inflow dish installed shall constitute full compensation for supplying all material, labor, tools, and equipment required to install manhole inflow dishes as described in Specification Section 02345, SEWER MANHOLE REHABILITATION.
3. The work under this section shall be paid at the contract unit price under Item 20c.

D. REPLACE MANHOLE FRAME AND COVER:

1. The work of this item shall be measured per manhole frame and cover set furnished and installed.
2. The contract unit price to be paid per manhole shall constitute full compensation for supplying all pavement replacement, site restoration, material, labor, tools, and equipment required to install the manhole frames and covers as described in Specification Section 02345, SEWER MANHOLE REHABILITATION.
3. The work under this section shall be paid at the contract unit price under Item 20d.

E. RAISE MANHOLE FRAME AND COVER TO GRADE:

1. The work of this item shall be measured per manhole frame and cover set raised to grade.
2. The contract unit price to be paid per manhole shall constitute full compensation for supplying all pavement replacement, site restoration, material, labor, tools, and equipment required to raise the manhole frames and covers to grade as described in Specification Section 02345, SEWER MANHOLE REHABILITATION.
3. The work under this section shall be paid at the contract unit price under Items 26b and 32c.

F. BUILD MANHOLE BENCHES AND INVERTS:

1. The work of this item shall be measured per manhole bench and invert built.
2. The contract unit price to be paid per manhole bench and invert built shall constitute full compensation for supplying all material, labor, tools, and equipment required to build the manhole bench and invert as specified in Section

02435, SEWER MANHOLE REHABILITATION.

3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Item 38b.

1.20 CLEANING AND INSPECTION AND OF SEWERS:

A. GENERAL:

1. The work under this item shall be measured at the unit price bid per linear foot cleaned and inspected. Incidental pre and post cleaning and inspection of other bid items shall not be paid for under this item.
2. Measurement shall be based on the actual length of sewer cleaned and inspected from center line of manhole to center line of manhole. Sewers shall be cleaned and inspected as specified in Section 02440, SEWER CLEANING AND INSPECTION. Verification of adequate cleaning shall be made by television inspection.
3. The television inspection work, digital video disks (DVD), external hard drives, by-pass pumping, plugging or blocking of sewer flow, and the storage, testing and disposal of any material retrieved from sewer cleaning shall be considered incidental to the work and shall not be considered for payment. All hard drives shall be given to the Owner upon completion of the project.
4. The work under this section shall be paid at the contract unit price under Item 21a.

1.21 POST CONSTRUCTION FLOW ISOLATION:

A. GENERAL :

1. The work of this item shall be measured at the unit price bid per linear foot of sewer flow isolated.
2. Measurement shall be based on the actual length of sewer flow isolated from centerline of manhole to centerline of manhole. Sewer lines will be flow isolated as specified in Section 02427, POST CONSTRUCTION FLOW ISOLATION.
3. The contract unit price to be paid per linear foot shall constitute full compensation for supplying all material, labor, tools and equipment to perform flow isolation as specified in Section 02427, POST CONSTRUCTION FLOW ISOLATION.

4. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
5. The work shall be paid for at the contract unit price under Items 22a, 27a, 33a, and 39a.

1.22 SEWER MAINLINE AND LATERAL EQUIPMENT TESTING:

The work of this section shall not be separately measured for payment but shall be considered incidental to the project.

1.23 CONNECTIONS TO EXISTING MAINS:

Unless otherwise indicated, the work of this section shall not be separately measured for payment but shall be considered incidental to the project.

1.24 ABANDONMENT OF EXISTING MAINS:

Unless otherwise indicated, the work of this section, including plugs, caps, concrete backing, or removal of valves and valve boxes as required, shall not be separately measured for payment, but shall be considered incidental to the project.

1.25 CURBING REPLACEMENT:

Unless otherwise indicated, the work of this section shall not be separately measured for payment but shall be considered incidental to the project.

1.26 EARTHWORK:

Earthwork shall be considered incidental to the work and shall not be measured separately for payment.

1.27 TRACER TAPE:

Unless otherwise indicated, the work of this section shall not be separately measured for payment but shall be considered incidental to the project.

1.28 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES:

Unless otherwise indicated, protection or temporary removal and replacement of existing utilities and structures as described in Section 01110 shall not be separately measured for payment but shall be considered incidental to the project.

1.29 DEWATERING:

Dewatering shall be considered incidental to the work and shall not be measured separately for payment.

1.30 ENVIRONMENTAL PROTECTION:

Environmental protection shall be considered incidental to the work and shall not be considered separately for payment.

1.31 HANDLING EXISTING FLOWS:

Handling existing sewage flows in accordance with the specifications, including providing, installing, and removing all required equipment, piping, and pumping as required shall not be measured separately for payment, but shall be considered incidental to the project.

1.32 SURFACE RESTORATION:

- A. The work for surface restoration shall include loaming and seeding and all incidentals thereto for all disturbed areas. This work shall not be separately measured for payment but shall be considered incidental to the project.
- B. Any existing fences which are required to be removed and reset shall not be separately measured for payment but shall be considered incidental to the project.

1.33 LOAMING AND SEEDING:

Unless otherwise indicated, the work of this section shall not be separately measured for payment but shall be considered incidental to the project.

1.34 LANDSCAPING:

Unless otherwise indicated, the work of this section shall not be separately measured for payment but shall be considered incidental to the project.

1.35 SIGNAGE:

The work of this section shall not be separately measured for payment but shall be considered incidental to the project.

1.36 TELEVISION INSPECTION VIDEOS:

Television inspection video tapes provided to the Owner shall not be separately measured for payment but shall be considered incidental to the project.

1.37     **WARRANTY INSPECTION:**

All warranty inspections and related work shall not be separately measured for payment but shall be considered incidental to the project.

1.38     **SUPPORT OF EXCAVATION:**

Unless otherwise indicated, the work of this section shall not be separately measured for payment but shall be considered incidental to the project.

1.39     **FIELD CONCRETE:**

Unless otherwise indicated, the work of this section shall not be separately measured for payment but shall be considered incidental to the project.

1.40     **CONSTRUCTION ZONE SAFETY PLAN:**

The work of this section shall not be separately measured for payment but shall be considered incidental to the project.

1.41     **UNIFORMED OFFICERS:**

The services of uniformed officers shall be provided and paid for by the Owner. Coordination effort by the Contractor shall be considered incidental to the project.

1.42     **SIDEWALKS:**

All sidewalk restoration and related work shall not be separately measured for payment but shall be considered incidental to the project.

1.43     **TRAFFIC SIGNAL LOOPING:**

Repair and/or replacement of traffic signal looping by authorized installers shall not be separately measured for payment but shall be considered incidental to the project.

1.44     **MOBILIZATION:**

The lump sum for items 9a, 23a, 28a, 34a, and 40a shall constitute full compensation to the Contractor for the general mobilization necessary to make the contract operational, exclusive of the cost of materials but including furnishing and maintaining the temporary facilities. The total for mobilization shall not exceed 5 percent of the total of Items 1 to 8, 10 to 22, 24 to 27, 29 to 33, and 35 to 39.

1.45 PRICE ADJUSTMENTS MANDATED BY MGL CHAPTER 30, SECTION 38A:

Price adjustments for certain payment items shall be as described in Specification Section 01250, PRICE ADJUSTMENTS. Payment shall be made at the unit prices included in Section 00410 or, if no such items are contained in Section 00410, by change order.

1.46 ABUTTER NOTIFICATIONS:

The Contractor shall produce and distribute door-to-door abutter notification letters at least two (2) working days prior to all work items. Notification language shall be approved by the Owner prior to distribution. Abutter notifications shall not be measured separately for payment but shall be considered incidental to the project.

END OF SECTION

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## SECTION 01330

### SUBMITTALS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. The Contractor shall provide the Engineer with submittals as required by the contract documents.

##### 1.02 RELATED WORK:

- A. Divisions 1 – 3 of these specifications that require submittals.

#### PART 2 - PRODUCTS

NOT USED

#### PART 3 - EXECUTION

##### 3.01 GENERAL:

- A. As required by the General Conditions, Contractor shall submit a schedule of shop and working drawing submittals.
- B. The Contractor shall submit the shop and working drawing submittals either electronically or hard copy.

##### 3.02 ELECTRONIC SUBMITTALS:

- A. In accordance with the accepted schedule, the Contractor shall submit promptly to the Engineer by email (davida@wseinc.com) or on Compact Disc (mail to Weston & Sampson Engineers, attention: CSD), one electronic copy in Portable Document Format (PDF) of shop or working drawings required as noted in the specifications, of equipment, structural details and materials fabricated especially for this Contract.
- B. Each electronic copy of the shop or working drawing shall be accompanied by the Engineer's standard shop drawing transmittal form, included as Exhibit 1 of this section (use only for electronic submittals), on which is a list of the drawings, descriptions and numbers and the names of the Owner, Project, Contractor and building, equipment or structure.
- C. The Contractor shall receive a shop drawing memorandum with the Engineer's approval or comments via email.

3.03 HARD COPY SUBMITTALS:

- A. In accordance with the accepted schedule, the Contractor shall submit promptly to the Engineer, by mail (to Weston & Sampson Engineers, attention: CSD), six (6) copies each of shop or working drawings required as noted in the specifications, of equipment, structural details and materials fabricated especially for this Contract.
- B. Each shipment of drawings shall be accompanied by the Engineer's (if applicable) standard shop drawing transmittal form on which is a list of the drawings, descriptions and numbers and the names of the Owner, Project, Contractor and building, equipment or structure.

3.04 SHOP AND WORKING DRAWINGS:

- A. Shop and working drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish of shop coat, grease fittings, etc., depending on the subject of the drawings. When it is customary to do so, when the dimensions are of particular importance, or when so specified, the drawings shall be certified by the manufacturer or fabricator as correct for this Contract.
- B. All shop and working drawings shall be submitted to the Engineer by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from his subcontractors and returning reviewed drawings to them. All shop and working drawings shall be prepared on standard size, 24-inch by 36-inch sheets, except those, which are made by changing existing standard shop or working drawings. All drawings shall be clearly marked with the names of the Owner, Project, Contractor and building, equipment or structure to which the drawing applies, and shall be suitably numbered. Each shipment of drawings shall be accompanied by the Engineer's (if applicable) standard shop drawing transmittal form on which is a list of the drawings, descriptions and numbers and the names mentioned above.
- C. Only drawings that have been prepared, checked and corrected by the fabricator should be submitted to the Contractor by his subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Contract Documents in all respects. Shop drawings shall be reviewed and marked with the date, checker's name and indication of the Contractor's approval, and only then shall be submitted to the Engineer. Shop drawings unsatisfactory to the Contractor shall be returned directly to their source for correction, without submittal to the Engineer. Shop drawings submitted to the Engineer without the Contractor's approval stamp and signature will be rejected. Any deviation from the Contract Documents indicated on the shop drawings must be identified on the drawings and in a separate submittal to the Engineer, as required in this section of the specifications and General Conditions.



- D. The Contractor shall be responsible for the prompt submittal and resubmittal, as necessary, of all shop and working drawings so that there will be no delay in the work due to the absence of such drawings.
- E. The Engineer will review the shop and working drawings as to their general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections of comments made on the drawings during the review do not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner. The review of the shop drawings is general and shall not relieve the Contractor of the responsibility for details of design, dimensions, code compliance, etc., necessary for interfacing with other components, proper fitting and construction of the work required by the Contract and for achieving the specified performance. The Engineer will review submittals two times: once upon original submission and a second time if the Engineer requires a revision or corrections. The Contractor shall reimburse the Owner amounts charged to the Owner by the Engineer for performing any review of a submittal for the third time or greater.
- F. With few exceptions, shop drawings will be reviewed and returned to the Contractor within 30 days of submittal.
- G. No material or equipment shall be purchased or fabricated especially for this Contract nor shall the Contractor proceed with any portion of the work, the design and details of which are dependent upon the design and details of equipment or other features for which review is required, until the required shop and working drawings have been submitted and reviewed by the Engineer as to their general conformance and compliance with the project and its Contract Documents. All materials and work involved in the construction shall then be as represented by said drawings.
- H. Two copies of the shop and working drawings and/or catalog cuts will be returned to the Contractor. The Contractor shall furnish additional copies of such drawings or catalog cuts when he needs more than two copies or when so requested.

### 3.05 SAMPLES:

- A. Samples specified in individual Sections include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols, and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the work.

- B. The number of samples submitted shall be as specified. Submittal and processing of samples shall follow the procedures outlined for shop and working drawings unless the specifications call for a field submittal or mock-up.
- C. Acceptance of samples will be acknowledged via a copy of the transmittal noting status. When samples are not acceptable, prompt resubmittal will be required.

END OF SECTION

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EXHIBIT 1 TO SECTION 01330 SUBMITTALS  
SHOP DRAWING TRANSMITTAL FORM

Shop Drawing Transmittal				Weston & Sampson			
<b>Instruction for Preparing Transmittal</b> No action will be taken on any item unless accompanied by this form. TRANSMITTAL NOS. to be consecutive (1, 2, 3, etc.). Each resubmittal of same item shall use same number with suffix letter (A, B, etc.). SPEC. SECT. NO.: Only one spec. section no. to each transmittal. DESCRIPTION: Complete identification of document or group of documents. SOURCE: Originator of document(s) being submitted.				DRAWING NO.: Identification of document(s). CONTRACT DRAWING REFERENCE: Contract drawing number(s) showing details of document(s). SPECIAL INSTRUCTIONS: Special cases and emergencies, changes in distribution and special handling requests, etc. should be entered here. SIGNATURE OF CONTRACTOR: Signature of individual who reviews and approves material prior to submittal to engineer.			
THIS SECTION TO BE COMPLETED BY CONTRACTOR							
TRANSM. NO.		SPEC. SECT. NO.		DATE		CONTRACTORS JOB NO.	
PROJECT NAME & CONTRACT NO.				LOCATION			
Attention: CSD ( <a href="mailto:David@wselinc.com">David@wselinc.com</a> ) Weston & Sampson Engineers, Inc. 5 Centennial Drive Peabody, MA 01960-7985				F R O M			
By W&S							
ITEM NO.	DESCRIPTION	SOURCE	DRAWING NO. CATALOG NO. BROCHURE, ETC	NO. OF COPIES	CONTRACT DRAWING REF.	ACTION CODE	REVIEWED BY
1							
2							
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THIS CERTIFIES THAT ALL ITEMS SUBMITTED HERewith HAVE BEEN CHECKED BY THE CONTRACTOR, ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, EXCEPT AS NOTED, AND ARE APPROVED BY THE CONTRACTOR FOR THIS PROJECT.							
THIS SECTION TO BE COMPLETED BY WESTON & SAMPSON							
ACTION CODE: 1. NO EXCEPTIONS TAKEN 2. MAKE CORRECTIONS NOTED 3. AMEND AND RESUBMIT 4. REJECTED-SEE REMARKS 5. ACKNOWLEDGEMENT 6. SUBMITTAL NOT REQUIRED-RETURNED WITHOUT REVIEW				8. INSTALLATION SHALL PROCEED ONLY WHEN ACTION CODE IS 1 OR 2 9. ACTION CODED 3 SHALL BE RESUBMITTED WITHIN TIME LIMIT SET IN CONTRACT 10. REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY OF COMPLIANCE WITH ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS			
				Weston & Sampson			

SECTION 01331  
DOCUMENTATION

PART 1 – GENERAL

1.01 WORK INCLUDED:

- A. This section covers the requirements for documentation to be furnished by the Contractor on this project.

1.02 RELATED WORK:

- A. Section 02427, POST CONSTRUCTION FLOW ISOLATION
- B. Section 02428, CURED-IN-PLACE PIPE
- C. Section 02440, SEWER CLEANING AND INSPECTION
- D. Section 02435, SEWER MANHOLE REHABILITATION
- E. Section 02437, SEWER LINE CHEMICAL ROOT TREATMENT
- F. Section 02442, POINT REPAIR OF GRAVITY SEWERS (OPEN-CUT)
- G. Section 02443, SERVICE CONNECTION REHABILITATION

1.03 DOCUMENTATION:

- A. The Contractor shall maintain printed television inspection logs of sewer segments, for each sewer line segment undergoing repair/rehabilitation under this contract and provide one (1) copy of the logs within five (5) working days of the work being performed. Log sheet format shall be approved by Engineer prior to start of work.
- B. The log sheet(s) as a minimum shall clearly identify:
  - 1. Project Name
  - 2. Street Location, Name, Intersection, Station
  - 3. Date of inspection
  - 4. Total Length of Line Inspected
  - 5. Line Size(s)/Joint Spacing/Type
  - 6. Line and Manhole(s) Condition

7. Significant observations such as service connections, offset joints, drop joints, broken/cracked pipe, protruding services, roots, collapsed sections, infiltration, presence of scale and corrosion and other discernible features.
  8. Filename.
- C. All logs shall be provided to the Engineer in PDF format (one log per PDF file) at the completion of the project.
  - D. All television inspection shall be recorded in MPEG-1 format and shall include accompanying audio. Inspections shall be recorded one at a time, with each segment recorded as a separate file. The Contractor shall provide videos to the Owner, at no additional cost, as requested by the Engineer during the Project. Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. "49011 to 49010 Downstream."
  - E. The Contractor shall additionally provide one (1) copy of all logs relative to work performed on sewer manholes within five (5) working days of the work being performed.
  - F. The Contractor shall take a digital photograph, in JPEG format, at each manhole **before** and **after** manhole rehabilitation. Filenames shall contain sub-area and manhole designations e.g. "49011." Digital photographs shall have a minimum resolution of ten (10) megapixels.
  - G. The Contractor shall provide Flow Isolation data in Microsoft Excel format.
  - H. The Contractor shall deliver to the Owner, at no additional cost, two (2) external hard drives each including the following information at the end of the project. The external hard drives shall be USB powered and capable of USB 3.0 connectivity and will become the property of the Owner upon delivery. The Contractor shall use file folders to organize individual types of data on the external hard drives. The Contractor shall include the following data on the external hard drives prior to delivery to the Engineer.
    - **Sewer Manhole Rehabilitation**
      - Pre and Post Rehabilitation Manhole Inspection Photos in JPEG format
        - Filenames shall contain sub-area and manhole designations e.g. "49011"
      - Each manhole rehabilitation log as a separate PDF file
        - Filenames shall contain sub-area and manhole designations e.g. "49011"
    - **Flow Isolation**
      - Microsoft Excel file with flow isolation data
      - Field logs as a PDF file
    - **Sewer Line Chemical Root Treatment**
      - Field logs as a PDF file

- **Cleaning and Inspection**
  - Television Inspection MPEG-1 Files
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “49011 to 49010 Downstream.”
  - Each television inspection log as a separate PDF file
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “49011 to 49010 Downstream.”
- **Cured-in-Place Pipe (and Structural Cured-in-Place Pipe) – Organized per Inversion**
  - Pre-inversion Television Inspection MPEG-1 Files
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “49011 to 49010 Downstream.”
  - Each pre-inversion television inspection log as a separate PDF file
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “49011 to 49010 Downstream.”
  - Each liner order sheet (describing the material ordered) as a separate PDF file
  - Each service connection reinstatement sign-off sheet as a separate PDF file
  - Each thermo couple log kept during inversion process as a separate PDF file
  - Post-inversion Television Inspection MPEG-1 Files
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “49011 to 49010 Downstream.”
  - Each post-inversion television inspection log as a separate PDF file
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “49011 to 49010 Downstream.”
  - Each material testing results report as a separate PDF file
- **Service Connection Test and Grout**
  - Television Inspection MPEG-1 Files
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “20015 to 20014 Downstream.”
  - Each television inspection log as a separate PDF file
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “20015 to 20014 Downstream.”

- **Service Connection Rehabilitation**
  - Television Inspection MPEG-1 Files
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “49011 to 49010 Downstream.”
  - Each television inspection log as a separate PDF file.
    - Filenames shall contain upstream and downstream sub-area and manhole designations as
- **Point Repair of Gravity Sewer (Open Cut)**
  - Television Inspection MPEG-1 Files
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “49011 to 49010 Downstream.”
  - Each television inspection log as a separate PDF file
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “49011 to 49010 Downstream.”
- **“Push Camera” Service Connection Television Inspection**
  - Television Inspection MPEG-1 Files
    - Filenames shall contain street address of service connection.

## PART 2 – PRODUCTS

Not applicable.

## PART 3 – EXECUTION

Not applicable.

END OF SECTION



## SECTION 01535

### TEMPORARY BYPASS PUMPING SYSTEM

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section includes furnishing of all materials, labor, equipment, power, and maintenance, to implement a temporary pumping system for the purpose of diverting existing sanitary sewer flows around the Mystic Street work area for the duration of the project.
- B. The design, installation, and operation of the temporary pumping system shall be the Contractor's responsibility. The Contractor shall employ the services of a vendor firm who can demonstrate to the Engineer that it has the required expertise in the design and operation of temporary bypass pumping systems. The vendor firm shall provide at least five (5) references of projects similar in size and complexity to this project that have been performed by the firm within the past three years.
- C. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.

##### 1.02 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. The Contractor shall submit a detailed description of the proposed pumping system stamped by a Professional Engineer in the State of Massachusetts and submit it and the vendor's references.
- B. The Contractor shall submit to the Engineer detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing sanitary sewer flows. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to insure proper protection of the facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements and permit conditions specified in these contract documents. No construction shall begin until all provisions and requirements have been reviewed by the Engineer.

C. The plan shall include but not be limited to the following:

1. Staging areas for pumps;
2. Flow diversion method and types of materials;
3. Number, size, material, location and method of installation of suction piping;
4. Number, size, material, method of installation and location of discharge piping;
5. Bypass pump sizes, capacity, number of each size to be on site and the related power requirements;
6. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted);
7. Standby power generator size, location;
8. Downstream discharge plan;
9. Method of protecting suction and discharge areas from erosion and damage;
10. Thrust and restraint block sizes and locations;
11. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill;
12. Method of noise control for each pump and/or generator, with external dB valve;
13. Any temporary pipe supports and anchoring required;
14. Design plans and computation for access to bypass pumping locations indicated on the drawings;
15. Calculations for selection of bypass pumping pipe size;
16. Schedule for installation of and maintenance of bypass pumping lines;
17. Plan indicating proposed location of bypass pumping lines.

1.03 RELATED WORK:

A. Section 01014, SCOPE AND SEQUENCE OF WORK

## PART 2 - MATERIALS

### 2.01 EQUIPMENT:

- A. All pumps used shall be centrifugal, end suction, fully automatic self-priming units that do not require the use of foot-valves, diaphragm pumps, isolation valves or vacuum pumps in the priming system. The pumps may be electric or diesel powered. All pumps used must be constructed to allow dry running for long periods to accommodate the cyclical nature of bypass flows. The pumps shall not be hydraulic submersible type.
- B. All pumps shall be Godwin Dri-prime Automatic Self-priming Pumps (CD, DPC, or HL Series) as manufactured by Godwin Pumps of America, Inc., (609) 467-3636, (301) 390-3806, or approved equal.
- C. The Contractor shall provide the necessary stop/start controls for each pump.
- D. The Contractor shall include one stand-by pump system (including suction and discharge piping) of each size to be maintained on site.
- E. Additional back-up pumps shall be on-line, isolated from the primary system by a valve.
- F. Discharge Piping - In order to prevent the accidental spillage of flows, all temporary discharge systems shall be constructed of rigid pipe with positive, restrained joints. Under no circumstances will aluminum "Irrigation" type piping or glued PVC pipe be allowed. Discharge hoses will only be allowed in short sections and with the specific permission of the Engineer.
- G. Allowable piping materials will be Godwin "QD" steel pipe (Godwin Pumps of America, Inc.), or fused, high-density polyethylene pipe as manufactured by Phillips Driscopipe, Inc., or approved equal.

### 2.02 SYSTEM DESCRIPTION:

#### A. DESIGN REQUIREMENTS:

- 1. Bypass pumping systems shall have sufficient capacity to pump flows incoming to manhole MA121 on Mystic Street; one (1) 15-inch diameter gravity sewer main and one (1) 6-inch diameter gravity sewer service pipe. The gravity sewer service pipe flows from a manhole, rather than a direct building connection. The Contractor shall provide all pipeline, plugs, pumps of adequate size to handle peak flow, and discharge piping to ensure that the total flow can be safely diverted around the area of work. Bypass pumping system will be required to operate 24 hours per day.
- 2. The Contractor shall have adequate standby power and pumping equipment available and ready for immediate operation and use in the event of an emergency

or breakdown. One standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure.

3. Bypass pumping system shall be capable of bypassing the flow around the work area and of releasing any amount of flow up to full available flow into the work area as necessary for satisfactory performance of work.
4. On April 19<sup>th</sup>, 2018, v-notch weirs were used to estimate the flows at the Mystic Street sewer siphon. The follow data is included for reference only:

<b>Time</b>	<b>Pipe Size</b>	<b>Weir Reading Low (GPD)</b>	<b>Weir Reading High (GPD)</b>	<b>Weir Reading Average (GPD)</b>
12:30 AM	15"	17,220	21,710	19,465
7:30 AM	15"	33,510	35,960	34,735

Note: The above flows are not exact representations of the maximum or minimum flow rates incoming to the Mystic Street sewer siphon. They are approximations of flow rates at a time of potential maximum and minimum flows on the day the information was obtained. Actual flow rates to be bypassed may vary during construction. The Contractor should review field conditions to properly design a temporary bypass pumping system,

**B. PERFORMANCE REQUIREMENTS:**

1. It is essential for the protection of the public safety and private property that there be no interruption in the flow throughout the duration of the project. To this end, the Contractor shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the sanitary sewer flow before it reaches the point where it would interfere with his work, carry it past his work and return it to the existing sanitary sewer system downstream of his work.
2. The design, installation, and operation of the temporary bypass pumping system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
3. The Contractor shall provide all necessary means to safely convey the sanitary sewer flow past the work area. The Contractor will not be permitted to stop or impede the flows under any circumstances.
4. The Contractor shall maintain flow around the work area in a manner that will not cause surcharging or significant level variations in the existing sewer system, and that will protect public and private property from damage and flooding.

5. The Contractor shall protect water resources, wetlands, and other natural resources.
6. The Contractor shall be responsible to meet noise requirements (73dbA @ 30'). All diesel driven primary and standby pumps shall be sound attenuated. The use of Critical Silenced Canopy Pumps or acoustical Whisper Pac enclosures for sound attenuation is required.

### PART 3 - EXECUTION

#### 3.01 FIELD QUALITY CONTROL AND MAINTENANCE:

- A. The Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to actual operation. The Engineer shall be given 24-hours notice prior to testing.
- B. Contractor shall inspect bypass pumping system every two (2) hours to ensure that the system is working correctly.
- C. The Contractor shall insure that the temporary pumping system is properly maintained, and a responsible operator shall be on hand at all times when pumps are operating.
- D. Spare parts for pumps and piping shall be kept on site as required.
- E. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

#### 3.02 PRECAUTIONS:

- A. Contractor is responsible for locating any existing utilities in the area the Contractor selects to locate the bypass pipelines. The Contractor shall locate his by pass pipelines to minimize any disturbance to existing utilities and shall obtain approval of the pipeline locations from the Owner and the Engineer. All costs associated with relocating utilities and obtaining all approvals shall be paid by the Contractor.
- B. During all bypass pumping operation, the Contractor shall protect the work area and all local utilities from damage inflicted by any equipment. The Contractor shall be responsible for all physical damage to public and private property caused by human or mechanical failure.

#### 3.03 INSTALLATION AND REMOVAL:

- A. The Contractor shall construct temporary bypass pumping structures only at the access locations indicated on the drawings and may be required to provide adequate suction conduit.

- B. Diverting or blocking of sanitary sewer flows shall incorporate primary and secondary devices. When diversion or blocking is no longer needed for performance and acceptance or work, it is to be removed in a manner that permits the flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.
- C. The Contractor shall exercise caution and comply with OSHA requirements when working in the presence of gases, combustible or oxygen-deficient atmospheres, and confined spaces.
- D. Except as specifically permitted, the installation of the bypass pipelines is prohibited in all salt marsh/wetland areas. The pipeline must be located off streets and sidewalks and on shoulders of the roads. When the bypass pipeline crosses local streets and private driveways, the Contractor must place the bypass pipelines in trenches and cover with temporary pavement. Upon completion of the bypass pumping operations, and after the receipt of written permission from the Engineer, the Contractor shall remove all the piping, restore all property to pre-construction condition and restore all pavement. The Contractor is responsible for obtaining any approvals from the Owner for placement of the temporary pipeline within public ways.
- E. The Owner has applied for an MWRA 8M permit related to the sewer bypass work on Mystic Street.

#### END OF SECTION

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SECTION 01550  
SIGNAGE (TRAFFIC CONTROL)

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers furnishing and installing traffic control signs and other devices.

1.02 SYSTEM DESCRIPTION:

The Contractor shall furnish and install all construction signs deemed necessary by and in accordance with the latest edition of Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) as published by the U.S. Department of Transportation.

PART 2 - PRODUCTS

2.01 TRAFFIC WARNING AND REGULATING DEVICES:

Contractor shall provide warning signs, barricades and other devices in accordance with the specifications provided in the MUTCD. Size of signs, lettering, colors, method of support and other factors prescribed in the MUTCD shall be adhered to.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Contractor shall erect barricades, barrier fences, traffic signs, and other traffic control devices as required by the MUTCD, or as required by the Engineer, to protect the work area from traffic, pedestrians, and animals.
- B. Contractor shall relocate barricades, signs and other devices as necessary as the work progresses.
- C. Unless extended protection is required for specific areas, when the work has been completed, all temporary warning and regulatory devices used by the Contractor shall be removed so that traffic can move unimpeded through the area.

END OF SECTION

## SECTION 01552

### CONSTRUCTION ZONE SAFETY PLAN

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers the provisions for complying with Commonwealth of Massachusetts requirements for construction zone safety plans on public works projects.

##### 1.02 DESCRIPTION:

- A. The Contractor shall implement traffic safety and control measures through the construction zone through road closures and detours and mitigate impacts on traffic outside of the construction zone in accordance with these contract documents.

##### 1.03 RELATED WORK:

- A. SECTION 01110, CONTROL OF WORK AND MATERIALS
- B. SECTION 01550, SIGNAGE (TRAFFIC CONTROL)
- C. SECTION 01553, UNIFORMED OFFICERS FOR TEMPORARY TRAFFIC CONTROL

##### 1.04 REFERENCES:

701 CMR 7.00 Use of Road Flaggers and Police Details on Public Works Projects

Massachusetts Department of Transportation Standard Specifications for Highways and Bridges – latest edition

#### PART 2 - PRODUCTS

- 2.01 Traffic control devices utilized by the Contractor shall meet the requirements of these contract documents and the latest Massachusetts Department of Transportation (MassDOT) Standard Specifications and Manual on Uniform Traffic Control Devices (MUTCD).



## PART 3 - EXECUTION

### 3.01 OPERATION:

- A. Contractor shall be responsible for providing all temporary traffic control devices including barricades, barrier fences, signs, drums, cones, impact attenuators and other traffic control devices in accordance with typical traffic management plans and details shown on the drawings or as required by the Engineer.
- B. The Contractor shall prepare temporary traffic management plans and details that deviates significantly from the typical plans shown on the drawings and submit to the Engineer for review and approval prior to start of the work.
- C. Contractor shall relocate barricades, signs, and other devices as necessary as the work progresses as required by the Owner's Traffic Control Officer or the Engineer.
- D. Police details shall be used as required for a safe work site as determined by the local police department.
- E. If police details fail to show up for work at the construction zone at the usual time for start of work, or otherwise leave the jobsite before work is completed for the day, the provisions of the Alternative Plan will be followed by the Contractor.

### 3.02 ALTERNATIVE PLAN:

- A. In accordance with 701 CMR 7.06(6), whenever required police details do not arrive on time or fail to show up for work, the Alternative Plan will be implemented by the Contractor.
- B. The Alternative Plan for this project is as follows:
  - 1. Redeploy crew to work in areas not requiring temporary traffic control (if available).

### END OF SECTION

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## SECTION 01553

### UNIFORMED OFFICERS FOR TEMPORARY TRAFFIC CONTROL

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers the provisions for furnishing Uniformed Officers for Traffic Control and Maintenance of Traffic as described in Section 01110, CONTROL OF WORK AND MATERIALS.

##### 1.02 DESCRIPTION:

- A. The Contractor shall coordinate with the local jurisdiction's Traffic Control Officer to determine the number of Officers deemed necessary to provide for public safety and to maintain a smooth flow of traffic through the construction area(s) affected.

##### 1.03 RELATED WORK:

- A. SECTION 01110, CONTROL OF WORK AND MATERIALS
- B. SECTION 01550, SIGNAGE (TRAFFIC CONTROL)
- C. SECTION 01552, CONSTRUCTION ZONE SAFETY PLAN

#### PART 2 - PRODUCTS

##### 2.01 UNIFORMED OFFICERS:

- A. Contractor shall provide the Traffic Control Officer with a minimum of 24 hours of notice indicating the time of day, street location and confirm number of officers required for traffic control.
- B. Contractor shall give the Traffic Control Officer a minimum of 2 hours prior cancellation notice should Contractor determine that due to weather or conditions beyond his control he would not need the scheduled officers.
- C. Contractor shall pay for officer(s) at the prevailing rate established by the local police department should officers not be needed and the Contractor fails to cancel the officers as noted in 2.01.B above.
- D. Where the Owner is paying directly for Traffic Officers and the Contractor cancels scheduled officers, the Contractor shall be responsible for payment of the wages for cancellations if not cancelled in accordance with 2.01.B and 2.01.C above.

### PART 3 - EXECUTION

#### 3.01 OPERATION:

- A. Contractor shall provide barricades, barrier fences, traffic signs, and other traffic control devices as required by the Owners Traffic Control Officer, or as required by the Engineer, to protect the work area from traffic, pedestrians, and animals.
- B. Contractor shall relocate barricades, signs and other devices as necessary as the work progresses as required by the Owners Traffic Control Officer or the Engineer.

END OF SECTION

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## SECTION 01562

### DUST CONTROL

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

This section of the specification covers the control of dust via calcium chloride and water, complete.

#### PART 2 - PRODUCTS

##### 2.01 CALCIUM CHLORIDE:

- A. Calcium chloride shall conform to the requirements of AASHTO-M 144, Type I or Type II and Specification for Calcium Chloride, ASTM D98. The calcium chloride shall be packaged in moisture proof bags or in airtight drums with the manufacturer, name of product, net weight, and percentage of calcium chloride guaranteed by the manufacturer legibly marked on each container.
- B. Calcium chloride failing to meet the requirements of the aforementioned specifications or that which has become caked or sticky in shipment may be rejected by the Engineer.

##### 2.02 WATER:

- A. Water shall not be brackish and shall be free from oil, acid, and injurious alkali or vegetable matter.

#### PART 3 - EXECUTION

##### 3.01 APPLICATION:

- A. Calcium chloride shall be applied when ordered by the Engineer and only in areas which will not be adversely affected by the application. See Section 01570, ENVIRONMENTAL PROTECTION.
- B. Calcium chloride shall be uniformly applied at the rate of 1-1/2 pounds per square yard or at any other rate as required by the Engineer. Application shall be by means of a mechanical spreader, or other approved methods. The number and frequency of applications shall be determined by the Engineer.
- C. Water may be sprinkler applied with equipment including a tank with gauge-equipped pressure pump and a nozzle-equipped spray bar.

- D. Water shall be dispersed through the nozzle under a minimum pressure of 20 pounds per square inch, gauge pressure.

#### END OF SECTION

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## SECTION 01564

### EXISTING FENCES

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

- A. This section of the specification covers the removal and resetting of existing fences.
- B. Where the removal of existing fences, at locations shown on the plans and where required by the Engineer, is required, the Contractor shall remove and reset such fences as required by the Engineer.

#### PART 2 - PRODUCTS

##### 2.01 FENCING:

- A. The materials removed shall be utilized to reset the fence. Where necessary, new posts and bases shall be furnished and installed by the Contractor. Any materials damaged or lost during or subsequent to removal shall be replaced by the Contractor without additional compensation.
- B. All new materials required shall be equal in quality and design to the materials in the present fences.

#### PART 3 - EXECUTION

##### 3.01 REMOVAL OF EXISTING FENCES:

- A. The present fences shall be carefully removed together with all appurtenances and satisfactorily stored and protected until required for resetting.

##### 3.02 ERECTION:

- A. Fences shall be reset plumb and to the grades required and shall conform to the original fence or as the Engineer requires. Backfilling around the posts shall consist of suitable material satisfactorily compacted. If the fence posts were originally set in concrete bases they shall be reset in concrete bases.

##### 3.03 PAINTING:

- A. Painting, if required, shall be done as required by the Engineer.

END OF SECTION

## SECTION 01570

### ENVIRONMENTAL PROTECTION

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION:

- A. The work covered by this section of the specifications consists of furnishing all labor, materials, tools and equipment, and performing all work required for the prevention of environmental pollution during and as a result of construction operations under this contract.
- B. The requirements set forth in this section of the specifications apply to cross-country areas, river and stream crossings, and construction in and adjacent to wetlands, unless otherwise specifically stated.
- C. All work under this Contract shall be in accordance with any conditional requirements applied, all of which are attached to Section 00890, PERMITS.
- D. Prior to commencement of work, the Contractor shall meet with representatives of the Engineer to develop mutual understandings relative to compliance of the environmental protection program.

##### 1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01330, SUBMITTALS
- C. Section 01562, DUST CONTROL
- D. Section 02240, DEWATERING
- E. Section 02252, SUPPORT OF EXCAVATION
- F. Section 02300, EARTHWORK

##### 1.03 SUBMITTALS:

- A. The Contractor shall submit for approval six sets of details and literature fully describing environmental protection methods to be employed in carrying out construction activities within 100 feet of wetlands or across areas designated as wetlands.

## PART 2 - PRODUCTS

### 2.01 STRAW WATTLES:

- A. Straw Wattles shall consist of a 100% biodegradable exterior jute or coir netting with 100% wheat straw interior filling as manufactured by Granite Environmental, Inc., Sebastian, Florida (Phone: 888-703-9889; website:www.GraniteEnvironmental.com), or approved equal.

### 2.02 CATCH BASIN PROTECTION:

- A. To trap sediment and to prevent sediment from clogging drainage systems, catch basin protection in the form of a siltation sack (Siltsack as manufactured by ACF Environmental, Inc. or approved equal) shall be provided as approved by the Engineer.

## PART 3- EXECUTION

### 3.01 NOTIFICATION AND STOPPAGE OF WORK:

- A. The Engineer will notify the Contractor in writing of any non-compliance with the provisions of this Section. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails to act promptly, the Owner may order stoppage of all or part of the work through the Engineer until satisfactory corrective action has been taken. No claim for an extension of time or for excess costs or damage incurred by the Contractor as a result of time lost due to any stop work orders shall be made unless it was later determined that the Contractor was in compliance.

### 3.02 AREA OF CONSTRUCTION ACTIVITY:

- A. Insofar as possible, the Contractor shall confine his construction activities to those areas defined by the plans and specifications. All land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction at least equal to that which existed prior to work under this contract.

### 3.03 PROTECTION OF WATER RESOURCES:

- A. The Contractor shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acids or other harmful materials. It is the Contractor's responsibility to comply with all applicable Federal, State, County and Municipal laws regarding pollution of rivers and streams.
- B. Special measures should be taken to insure against spillage of any pollutants into public waters.



### 3.04 CONSTRUCTION IN AREAS DESIGNATED AS WETLANDS ON THE DRAWINGS:

- A. Insofar as possible, the Contractor shall make every effort to minimize disturbance within areas designated as wetlands or within 100-feet of wetland resource areas. Total easement widths shall be limited to the widths shown.
- B. The Contractor shall perform his work in such a way that these areas are left in the condition existing prior to construction.
- C. The elevations of areas designated as wetlands shall not be unduly disturbed by the Contractor's operations outside of the trench limits. If such disturbance does occur, the Contractor shall take all measures necessary to return these areas to the elevations which existed prior to construction.
- D. In areas designated as wetlands, the Contractor shall carefully remove and stockpile the top 24 inches of soil. This topsoil material shall be used as backfill for the trench excavation top layer. The elevation of the trench shall be restored to the preconstruction elevations wherever disturbed by the Contractor's operation.
- E. The Contractor shall use a trench box, sheeting or bracing to support the excavation in areas designated as wetlands.
- F. Excavated materials shall not be permanently placed or temporarily stored in areas designated as wetlands. Temporary storage areas for excavated material shall be as required by the Engineer.
- G. The use of a temporary gravel roadway to construct the pipeline in the wetlands area is not acceptable. The Contractor will be required to utilize timber or rubber matting to support his equipment in these areas. The timber or rubber matting shall be constructed in such a way that it is capable of supporting all equipment necessary to install the pipeline. The timber or rubber matting shall be constructed of materials and placed in such a way that when removed the material below the matting will not be unduly disturbed, mixed or compacted so as to adversely affect recovery of the existing plant life.
- H. Bentonite dams shall be placed in wetlands to prevent drainage. Locations for dams are as indicated on the drawings or as required by the Engineer.
- I. During construction, easements within wetlands shall be lined with a continuous line of straw wattles (aka compost filter tube, silt/filter sock).

### 3.05 PROTECTING AND MINIMIZING EXPOSED AREAS:

- A. The Contractor shall limit the area of land which is exposed and free from vegetation during construction. In areas where the period of exposure will be greater than two (2) months, temporary vegetation, mulching or other protective measures shall be provided as specified.

- B. The Contractor shall take account of the conditions of the soil where temporary cover crop will be used to insure that materials used for temporary vegetation are adaptive to the sediment control. Materials to be used for temporary vegetation shall be approved by the Engineer.

### 3.06 LOCATION OF STORAGE AREAS:

- A. The location of the Contractor's storage areas for equipment and/or materials shall be upon cleared portions of the job site or areas to be cleared as a part of this project, and shall require written approval of the Engineer. Plans showing storage facilities for equipment and materials shall be submitted for approval of the Engineer.
- B. No excavated materials or materials used in backfill operations shall be deposited within a minimum distance of one hundred (100) feet of any watercourse or any drainage facility. Adequate measures for erosion and sediment control such as the placement of straw wattles around the downstream perimeter of stockpiles shall be employed to protect any downstream areas from siltation.
- C. There shall be no storage of equipment or materials in areas designated as wetlands.
- D. The Engineer may designate a particular area or areas where the Contractor may store materials used in his operations.
- E. Storage areas in cross-country locations shall be restored to pre-construction conditions with the planting of native species of trees and shrubs.

### 3.07 PROTECTION OF LANDSCAPE:

- A. The Contractor shall not deface, injure, or destroy trees or shrubs nor remove or cut them without written authority from the Owner. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorages unless specifically authorized by the Engineer. Excavating machinery and cranes shall be of suitable type and be operated with care to prevent injury to trees which are not to be removed, particularly overhanging branches and limbs. The Contractor shall, in any event, be responsible for any damage resulting from such use.
- B. Branches, limbs, and roots shall not be cut except by permission of the Engineer. All cutting shall be smoothly and neatly done without splitting or crushing. When there is unavoidable injury to branches, limbs and trunks of trees, the injured portions shall be neatly trimmed and covered with an application of grafting wax or tree healing paint as directed.
- C. Where, in the opinion of the Engineer, trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment or by his blasting or other operations, the Engineer may require the Contractor to adequately protect such trees by placing boards, planks, poles or fencing around them. Any trees or landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as

nearly as possible to its original condition at the expense of the Contractor. The Engineer will decide what method of restoration shall be used, and whether damaged trees shall be treated and healed or removed and disposed of.

- D. Cultivated hedges, shrubs, and plants which could be injured by the Contractor's operations shall be protected by suitable means or shall be dug up, balled and temporarily replanted and maintained. After construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of a kind and quality at least equal to that existing at the start of the work.

### 3.08 DISCHARGE OF DEWATERING OPERATIONS:

- A. Any water that is pumped and discharged from the trench and/or excavation as part of the Contractor's water handling shall be filtered by an approved method prior to its discharge into a receiving water or drainage system.
- B. Under no circumstances shall the Contractor discharge water to the areas designated as wetlands. When constructing in a wetlands area, the Contractor shall discharge water from dewatering operations directly to the nearest drainage system, stream, or waterway after filtering by an approved method.
- C. The pumped water shall be filtered through filter fabric and baled straw, a vegetative filter strip or a vegetated channel to trap sediment occurring as a result of the construction operations. The vegetated channel shall be constructed such that the discharge flow rate shall not exceed a velocity of more than 1 foot per second. Accumulated sediment shall be cleared from the channel periodically.

### 3.09 DUST CONTROL:

- A. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of streets as necessary, to minimize creation and dispersion of dust. If the Engineer decides it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed. Calcium chloride shall be as specified under Section 01562, DUST CONTROL.
- B. Calcium Chloride shall not be used for dust control within a drainage basin or in the vicinity of any source of potable water.

### 3.10 BALED STRAW:

- A. To trap sediment and to prevent sediment from clogging drainage systems, baled straw shall be used. Care shall be taken to keep the bales from breaking apart. The bales

should be securely staked to prevent overturning, flotation, or displacement. All deposited sediment shall be removed periodically.

### 3.11 CATCH BASIN PROTECTION:

- A. Catch basin protection shall be used for every catch basin, shown on the plans or as required by the Engineer, to trap sediment and prevent it from clogging drainage systems and entering wetlands. Siltation sacks shall be securely installed under the catch basin grate. Care shall be taken to keep the siltation sacks from breaking apart or clogging. All deposited sediment shall be removed periodically and at times prior to predicted precipitation to allow free drainage flow. Prior to working in areas where catch basins are to be protected, each catch basin sump shall be cleaned of all debris and protected. The contractor shall properly dispose of all debris at no additional cost to the Owner.

### 3.12 STRAW WATTLES:

- A. The wattles will be placed in a shallow trench (2-3 inches deep) and staked in the ground using wooden stakes driven at 4-foot intervals. The wooden stakes will be placed at a minimum depth of 24-inches into the ground.

END OF SECTION

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## SECTION 01575

### HANDLING EXISTING FLOWS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This Section covers all materials, equipment, and labor required to handle existing sanitary and combined sewage flows and installation and maintenance of all temporary connections, plugs, and by-pass pumping. Upon completion of the construction and rehabilitations, all temporary plugs and connections shall be removed, and flows shall be returned to the existing system. Plug, fill, and abandon existing pipes as shown on the drawings or as specified herein.

##### 1.02 RELATED WORK:

Section 01330, SUBMITTALS

Section 01535, TEMPORARY BYPASS PUMPING SYSTEM

Section 02058, CONTROLLED DENSITY FILL

##### 1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six (6) sets of complete, checked shop drawings, showing equipment, method of by-passing, and the method of transferring flows from the existing system to the new system.

#### PART 2 - PRODUCTS - NOT APPLICABLE

#### PART 3 - EXECUTION

##### 3.01 MAINTAINING EXISTING FLOWS:

- A. The Contractor shall maintain all flows in the existing system until construction and/or rehabilitation is complete and ready for safe operation.
- B. The Contractor shall protect against surcharging of the existing system upstream of the work area by installing adequate temporary bypass pumping to handle dry weather and wet weather flows.

- C. The Contractor shall repair any damage that occurs to existing pipes and structures to the satisfaction of the Engineer. Work performed under this section shall be considered incidental and shall not be measured separately for payment.
- D. Existing pipes to be abandoned shall be filled with controlled density fill as specified in Section 02058 – CONTROLLED DENSITY FILL (CDF). Plugs shall be installed and pipes to be abandoned at locations shown on the drawings.
- E. The Contractor shall not allow sanitary flow to discharge to any salt or fresh water body by means of overflow, by-pass pumping, or any other method that may contaminate these water areas.

END OF SECTION

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## SECTION 01740

### CLEANING UP

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

The Contractor must employ at all times during the progress of its work adequate cleanup measures and safety precautions to prevent injuries to persons or damage to property. The Contractor shall immediately, upon request by the Engineer provide adequate material, equipment and labor to cleanup and make safe any and all areas deemed necessary by the Engineer.

##### 1.02 RELATED WORK:

- A. Section 00700, GENERAL CONDITIONS
- B. Section 01110, CONTROL OF WORK AND MATERIALS
- C. Section 01140, SPECIAL PROVISIONS
- D. Section 01570, ENVIRONMENTAL PROTECTION

#### PART 2 - PRODUCTS

Not applicable.

#### PART 3 - EXECUTION

##### 3.01 DAILY CLEANUP:

- A. The Contractor shall clean up, at least daily, all refuse, rubbish, scrap and surplus material, debris and unneeded construction equipment resulting from the construction operations and sweep the area. The site of the work and the adjacent areas affected thereby shall at all times present a neat, orderly and workmanlike appearance.
- B. Upon written notification by the Engineer, the Contractor shall within 24 hours clean up those areas, which in the Engineer's opinion are in violation of this section and the above referenced sections of the specifications.
- C. If in the opinion of the Engineer, the referenced areas are not satisfactorily cleaned up, all other work on the project shall stop until the cleanup is satisfactory.

3.02 MATERIAL OR DEBRIS IN DRAINAGE FACILITIES:

- A. Where material or debris has washed or flowed into or has been placed in existing watercourses, ditches, gutters, drains, pipes, structures, such material or debris shall be entirely removed and satisfactorily disposed of during progress of the work, and the ditches, channels, drains, pipes, structures, and work shall, upon completion of the work, be left in a clean and neat condition.

3.03 REMOVAL OF TEMPORARY BUILDINGS, STRUCTURES AND EQUIPMENT:

- A. On or before completion of the work, the Contractor shall, unless otherwise specifically required or permitted in writing, tear down and remove all temporary buildings and structures it built; shall remove all temporary works, tools and machinery or other construction equipment it furnished; shall remove all rubbish from any grounds which it has occupied; shall remove silt fences and hay bales used for trapping sediment; and shall leave the roads and all parts of the property and adjacent property affected by its operations in a neat and satisfactory condition.

3.04 RESTORATION OF DAMAGED PROPERTY:

- A. The Contractor shall restore or replace, when and as required, any property damaged by its work, equipment or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk and landscaping work. Materials, equipment, and methods for such restoration shall be as approved by the Engineer.

3.05 FINAL CLEANUP:

- A. Before acceptance by the Owner, the Contractor shall perform a final cleanup to bring the construction site to its original or specified condition. This cleanup shall include removing all trash and debris off of the premises. Before acceptance, the Engineer shall approve the condition of the site.

END OF SECTION

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## SECTION 02058

### CONTROLLED DENSITY FILL (CDF)

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

- A. Controlled Density Fill is to be used where indicated on the contract drawings or as described in any Massachusetts Department of Transportation road opening permits included in the project.

##### 1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01110, CONTROL OF WORK AND MATERIALS
- C. Section 01270, MEASUREMENT AND PAYMENT
- D. Section 01330, SUBMITTALS
- E. Section 02300, EARTHWORK
- F. Section 02252, SUPPORT OF EXCAVATION

##### 1.03 REFERENCES:

Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges - Subsection M4.08.0, CONTROLLED DENSITY FILL.

##### 1.04 SUBMITTALS:

Proposed Mix Designs for the type(s) of Controlled Density Fill shall be submitted for review and approval from the Contractor's Ready-Mix provider in accordance with Section 01330, SUBMITTALS.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS:

Materials employed in the Controlled Density Fill shall meet the requirements as described in MassDOT Standard Specifications Subsection M4.08.0.

##### 2.02 TYPE OF CONTROLLED DENSITY FILL:

Controlled Density Fill for this project shall be Type 1E - Very Flowable (Excavatable), as described in MassDOT Subsection M4.08.0.

## PART 3 - EXECUTION

### 3.01 GENERAL:

- A. Controlled Density Fill shall be batched at a ready-mix plant and is to be used at a high or very high slump of approximately 10- to 12-inches. It shall be flowable, require no vibration and after it has been placed for Type 1E and 2E, be excavatable by hand tools and/or small machines.
- B. Controlled Density Fill shall be placed so as to not disturb adjacent structures, utilities or the sidewalls of trenches.
- C. Controlled Density Fill shall be installed to the limits shown on the drawings or required by permit and shall be kept below the top of the trench to allow for the placement of the required depth of pavement as specified in these documents or as indicated in the contract drawings.
- D. Steel road plates shall protect the Controlled Density Fill until the fill reaches a point that it will not be deformed by traffic passing over it. Plates are not to be removed until the day that paving operations are performed.

END OF SECTION

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## SECTION 02085

### POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This section covers the furnishing and installation of Polyvinyl Chloride (PVC) pipe and fittings, as indicated on the drawings and as specified herein.

##### 1.02 RELATED WORK:

- A. Section 02252, SUPPORT OF EXCAVATION
- B. Section 02300, EARTHWORK
- C. Section 02631, PRECAST MANHOLES

##### 1.03 REFERENCES:

- A. The following standards form a part of these specifications as referenced:

#### American Society for Testing and Materials (ASTM)

ASTM	D2321	Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe
ASTM	D3034	Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings
ASTM	D3212	Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM	F679	Specification for Polyvinyl Chloride (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings

##### 1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six (6) sets of manufacturer's literature of the materials of this section shall be submitted to the Engineer for review.

## PART 2 - PRODUCTS

### 2.01 MATERIALS:

- A. PVC non-pressure sewer pipe 4-inches through 15-inches diameter shall conform to ASTM D3034, 18-inches through 60-inches diameter to ASTM F679, all with SDR of 35 unless noted, and shall meet the specific requirements and exceptions to the aforementioned specifications that follow.
- B. PVC non-pressure sewer pipe shall be furnished in standard lengths.
- C. One pipe bell consisting of an integral wall section with a solid cross section rubber ring, factory assembled, shall be furnished with each standard, random and short length of pipe. Rubber rings shall be provided to the requirements of ASTM D3212.
- D. The rubber ring shall be retained within the bell of the pipe by a precision formed groove or recess designed to resist fishmouthing or creeping during assembly of joints.
- E. Spigot pipe ends shall be supplied with bevels from the manufacturer to ensure proper insertion. Each spigot end shall have an "assembly stripe" imprinted thereon to which the bell end of the mated pipe will extend upon proper jointing of the two pipes.
- F. PVC fittings shall be provided with bell and/or spigot configurations with rubber gasketed joints compatible with that of the pipe. Bend fittings with spigot ends shorter than the pipe recess bells will not be allowed. The shorter spigot end would not allow proper seating of the spigot in the mating bell and would permit undesired contact between the mating bell and the outside of the fitting bell.
- G. All pipe delivered to the job site shall be accompanied by independent testing laboratory reports certifying that the pipe and fittings conform to the above-mentioned specifications. In addition, the pipe shall be subject to thorough inspection and tests, the right being reserved for the Engineer to apply such of the tests specified as he may from time to time deem necessary.
- H. All cutting of pipe shall be done with a machine suitable for cutting PVC pipe. Cut ends shall be beveled when recommended by the pipe manufacturer.

## PART 3 - EXECUTION

### 3.01 INSTALLATION:

- A. Except as modified herein, installation of the PVC pipe shall be in accordance with ASTM D2321.
- B. Each pipe length shall be inspected before being laid to verify that it is not cracked. Pipe shall be laid to conform to the lines and grades indicated on the drawings or given by the Engineer.

Each pipe shall be so laid as to form a close joint with the next adjoining pipe and bring the inverts continuously to the required grade.

- C. The pipe shall be supported by compacted crushed stone. Crushed stone shall be as specified under Section 02300, EARTHWORK.
- D. The pipe shall not be driven down to grade by striking it with a shovel handle, timber, rammer, or other unyielding object. When each pipe has been properly bedded, enough of the backfill material shall be placed and compacted between the pipe and the sides of the trench to hold the pipe in correct alignment.
- E. Before a joint is made, the pipe shall be checked to assure that a close joint with the next adjoining pipe has been maintained and that inverts are matched and conform to the required line and grade.
- F. For pipe placed on crushed stone, immediately after the joint is made, the jointing area shall be filled with suitable materials so placed and compacted that the ends of either pipe will not settle under backfill load.
- G. No pipe or fitting shall be permanently supported on saddles, blocking, or stones.
- H. Branches and fittings shall be laid by the Contractor as indicated on the drawings, and/or as required by the Engineer. Open ends of pipe and branches shall be closed with PVC caps secured in place with premolded gasket joints or as required by the Engineer.
- I. All pipe joints shall be made as nearly watertight as practicable. There shall be no visible leakage at the joints and there shall be no sand, silt, clay, or soil of any description entering the pipeline at the joints. Where there is evidence of water or soil entering the pipeline, connecting pipes, or structures, the defects shall be repaired to the satisfaction of the Engineer.
- J. The Contractor shall build a tight bulkhead in the pipeline where new work enters an existing sewer. This bulkhead shall remain in place until the Engineer authorizes its removal.
- K. Care shall be taken to prevent earth, water, and other materials from entering the pipe, and when pipe laying operations are suspended, the Contractor shall maintain a suitable stopper in the end of the pipe and also at openings for manholes.
- L. As soon as possible after the pipe and manholes are completed on any street, the Contractor shall flush out the new pipeline using a rubber ball ahead of the water, and none of the flushing water or debris shall be permitted to enter any existing sewer.

3.02 QUALITY ASSURANCE:

A. POST EXCAVATION INSPECTION:

1. On completion of a section of sewer, including building connections installed to the property line, the Contractor shall television inspect the section in accordance with Section 02440, Sewer Cleaning and Inspection at no additional cost to the Owner.
2. The Contractor shall be responsible for the satisfactory water-tightness of the entire section of the sewer. Should the Engineer determine that the sections inspected are unsatisfactory, the Contractor shall do all work required to locate and repair the defects and re-inspect as the Engineer may require without additional compensation.
3. A plan of the method for repairing any defects that are found shall be submitted to the Engineer for review.

END OF SECTION

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## SECTION 02222

### ABANDONMENT OF SEWERS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers the abandonment of sewers through various means including furnishing, handling and installation of all concrete and masonry plugs; removal and disposal of manholes, and filling existing pipes with controlled density fill, as shown on the Drawings and specified herein.
- B. The Contractor shall furnish all materials, tools, labor, and equipment to abandon existing sewers.

##### 1.02 RELATED WORK:

- A. Section 02058, CONTROLLED DENSITY FILL (CDF)
- B. Section 03302, FIELD CONCRETE

##### 1.03 REFERENCES:

The following standards form a part of this specification, as referenced:

American Society for Testing and Materials (ASTM)

ASTM C32      Specifications for Sewer and Manhole Brick (Made from Clay or shale).

##### 1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

The Contractor shall submit six (6) sets of its plan for abandoning existing pipe, showing equipment, methods and materials. The plan shall be submitted to and reviewed by the Engineer before construction.

#### PART 2 - PRODUCTS

##### 2.01 PLUGS:

- A. Plugs installed at the open ends of the pipe to be abandoned shall be 12-inch thick 3,000-psi cement concrete, or 8-inch thick brick masonry as directed. The pipes to be abandoned include all sewer as specified herein and as shown on the Drawings.

- B. Precast cement concrete plugs that are used shall meet the requirements for 3,000 psi concrete and shall be free of cracks and spalls. Brick masonry plugs shall be made of brick meeting the requirements of ASTM C32, for grade SS, hard brick.
- C. Mortar shall be composed of portland cement, hydrated lime, and sand, and the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. In general, mortar for grade SS brick shall be mixed in the volume proportions of 1:1/2:4-1/2; portland cement to hydrated lime to sand. The cement concrete plug shall be covered with non-shrink grout to prevent leakage at the plug.

2.02 PIPE FILL:

- A. Fill used for the abandonment of sewers as shown on the drawings shall consist of controlled density fill meeting the requirements included in Section 02058, CONTROLLED DENSITY FILL (CDF).
- B. Any variance from the specified material shown on the plans or as specified herein for the abandonment of the pipeline shall be subject to the written approval of the Engineer.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. PLUGS:

1. Existing sewers shall be plugged with 3,000 psi concrete or with brick masonry, as required by the Engineer.
2. Plugs shall be of adequate strength to withstand the full soil and groundwater pressure but not less than 5 psi.
3. Masonry plugs shall be at least 8-inches thick and concrete plugs shall be at least 12-inches thick. Pipes entering a manhole or catch basin that are to be abandoned shall have a plug installed that is flush with the interior wall of the structure.

B. PIPE FILL:

1. Existing sewers shall be abandoned and filled with controlled density fill, and plugged, as shown on the Drawings.
2. The method of filling the abandoned pipeline shall fill a minimum of 95 percent of the total annular volume of the pipe.



### 3.02 REMOVAL AND DISPOSAL OF MANHOLES:

#### A. REMOVAL OF MANHOLES:

1. Frames and covers will be removed and delivered to the place designated by the Owner.
2. The Contractor shall remove all sections of the existing manhole.
3. The Contractor shall place and compact clean fill, or controlled density fill (CDF) in the void left by the removal of the manhole, as shown on the Drawings.
4. The ground or paved surface shall be restored in accordance with the drawings.

#### B. DISPOSAL OF MANHOLES:

1. The Contractor shall dispose of all manhole materials that are to be removed. Unless the Owner designates a site for receiving the removed materials, the Contractor shall dispose of the materials at a site of his own choosing.

END OF SECTION

## SECTION 02225

### PIPE BURSTING CONSTRUCTION

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section includes furnishing all labor, materials, transportation and equipment necessary for the replacement of existing sanitary sewers by means of the installation of a new pipe in place of an existing host conduit utilizing the Pipe Bursting System. Pipe bursting is a system by which pneumatic burster unit splits the existing pipe, while simultaneously installing a new polyethylene pipe where the old pipe existed.

##### 1.02 RELATED WORK:

- A. Section 01535 – TEMPORARY BYPASS PUMPING SYSTEM
- B. Section 01575 - HANDLING EXISTING FLOWS
- C. Section 01740 - CLEANING UP
- D. Section 02240 - DEWATERING
- E. Section 02252 - SUPPORT OF EXCAVATION
- F. Section 02300 - EARTHWORK
- G. Section 02440 - SEWER CLEANING AND INSPECTION
- H. Section 02624 - HIGH DENSITY POLYETHYLENE PIPE

##### 1.03 SYSTEM DESCRIPTION:

- A. This section covers the rehabilitation of existing sanitary sewers using the pipe bursting system as called for herein and on the drawings. Pneumatically or hydraulically operated equipment shall be used to burst the existing host conduit and install the replacement pipe as described in NASSCO Specification Guidelines.

##### 1.04 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in pipe bursting services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.
- B. The Contractor shall be certified by the Pipe Bursting System Manufacturer that the Contractor is a trained user and/or licensed installer of their system.
- C. The Contractor shall “Hold Harmless” the Owner and the Engineer, in any legal action resulting from patent infringements.

#### 1.05 REFERENCES:

- A. The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM F714 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter,

ASTM D1248 – Specification for Polyethylene Plastics Molding and Extrusion Materials

The National Association of Sewer Service Companies (NASSCO)

Recommended Specifications for Sewer Collection System Rehabilitation (Current Edition).

Uni-Bell PVC Pipe Association

UNI-B-6 -Recommended Practice for Low Pressure Air Testing of Installed Sewer Pipe

#### 1.06 SUBMITTALS:

IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS,  
SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit six (6) sets of the following:
1. Qualifications of the firm/personnel who will perform the Work.
  2. Descriptions of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
  3. Submit a written description of the system, equipment, and materials proposed for the pipe bursting operation, including pit dimensions, support of excavations, and locations required for equipment and material access.
  4. A statement containing the pipe bursting Contractor's name, address, the years of experience in pipe bursting of the type being proposed in accordance with Paragraph 1.04.A, and at least three references relating to the same type of work being proposed, with telephone numbers, and contact person shall be submitted.
  5. The contractor shall submit Design Calculations as described in Paragraph 1.07 for the HDPE pipe proposed. A licensed Professional Engineer registered in the state where the project is to be constructed shall prepare the calculations.
  6. Submit Certificate of Compliance for HDPE Pipe from the manufacturer.

7. Submit the Certificate by the Pipe Bursting System Manufacturer that the Contractor is a trained user and/or licensed installer of their system.

A MINIMUM OF SIX (6) COPIES OF THE INFORMATION OR DATA REQUIRED SHALL BE SUBMITTED FOR APPROVAL.

1.07 DESIGN CALCULATIONS:

- A. The HDPE shall be designed to withstand the maximum load that the Contractor anticipates will be exerted on the pipe during the pipe bursting operations with the appropriate factors of safety. The design calculations shall also include all loadings from hydrostatic, earth and live loads that may be applied to the HDPE pipe.
- B. For the purpose of designing the HDPE for horizontal and vertical loads the Contractor shall use the conditions indicated below:

Surface Elevation	refer to drawings
Groundwater Elevation <sup>(1)</sup>	Varies with adjacent stream and weather conditions
Invert of the Host Pipe	refer to drawings
Soil Unit Weight <sup>(2)</sup>	115 pcf (Upper Layer 0' to 6')
	120 pcf (Lower Layer 6' and below)
	125 pcf (Gravel Borrow)
Design Life	50 Years
Factor of Safety	2.5
Live Load	HS-20-44

Note:

1. During a field investigation performed between August 28<sup>th</sup> 2017 and August 30 2017, the approximate stream water level <sup>(2)</sup> was approximately 6' to 7' below the ground surface.
  2. Soil Unit Weights are approximate parameters recommended for design provided by the Town of Arlington Geotechnical Report for the replacement of bridge A-10-015 (Mystic Street over Mill Brook), December 2017, prepared by Gill Engineering Associates, Inc. The approximate water level of Mill Brook was also provided in the referenced report.
- C. The Contractor shall submit test results with respect to the physical characteristics of the HDPE pipe. These tests shall be at no additional cost to the Owner. These tests shall include the following:
    1. Test for Tensile Strength of HDPE material in accordance with ASTM D638, minimum tensile strength shall be 3,100 psi.
    2. Tests for the determination of Environmental Stress Crack Resistance [ESCR] shall be in accordance with ASTM F1248 with a ESCR test equal to 2,000 hours.

1.08 DELIVERY, STORAGE, AND HANDLING:

- A. Transport, handle, and store pipe and fittings as recommended by the manufacturer.
- B. If new pipe and fittings become damaged before or during installation, it shall be repaired as recommended by the manufacturer or replaced at the Contractor's expense as required by the Engineer.
- C. Deliver, store and handle other materials as required to prevent damage.

1.09 WARRANTY:

- A. Newly installed pipe shall be warranted against infiltration and faulty workmanship and materials for one (1) year from the date the project is accepted by the Owner.

PART 2 - PRODUCTS:

2.01 MATERIALS:

- A. Polyethylene Plastic Pipe shall be high-density polyethylene pipe and meet the applicable requirements of ASTM F714 Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter, and ASTM D1248 Specification for Polyethylene Plastics Molding and Extrusion Materials.
  - 1. The nominal diameter of the HDPE pipe to be installed shall be as indicated on the contract drawings.
  - 2. The thickness of the HDPE pipe to be installed shall be as determined by the manufacturer for the minimum thickness to meet the design structural requirements in accordance with Paragraph 1.07, A through D. The minimum SDR rating shall be SDR 17.
  - 3. The finished HDPE pipe shall be continuous over the entire length of pipe bursting/insertion between access pit locations. The HDPE shall be impervious and free from any leakage from the rehabilitated host conduit to the surrounding ground or from the surrounding ground to the inside of the HDPE.
  - 4. The HDPE materials, when cured, shall be chemically resistant to withstand internal exposure to sewage gases containing hydrogen sulfide, carbon monoxide, carbon dioxide and methane.
- B. Tests for compliance with this specification shall be made as specific herein and in accordance with the applicable ASTM Standards. A certificate shall be furnished by the manufacturer for all material furnished under this specification. Polyethylene plastic pipe and fittings shall meet the requirements of this specification.

- C. The method approved for rehabilitation of existing sanitary sewers by means of the installation of a new polyethylene pipe is T.T. Technologies Grundocrack Pipe Bursting System, (800-533-2078) or approved equal.
- D. Solid sleeve couplings shall have ductile iron sleeve and flanges (ASTM A536) and corrosion resistant, high strength alloy bolts and nuts (AWWA C-111, ANSI A21.11). Transition couplings shall be utilized, where necessary, to join pipes of the same nominal size that have different outside diameters. Gaskets shall be suitable for use with wastewater. Couplings shall be Type 210-212 by JCM Industries, Nash, Texas; Style 501 by Romac Industries, Inc., Bothell, Washington; or approved equal.
- E. All HDPE plain end pipe connections utilizing mechanical fittings shall have circumferential inside supports ("stiffeners"), with a minimum 18 – 8 Type 304 stainless steel (ASTM 240) and a minimum width of 6-inches. Stiffeners shall have a permanent outside diameter that fits into the pipe's inside diameter and maintains concentricity of the pipe. Stiffeners shall be appropriate for the SDR rating of the pipe and couplings. Circumferential inside supports shall be Type 206 Stiffening Inserts by Romac Industries, Inc., Bothell, Washington; Type 230/231 Stiffening Inserts by JCM Industries, Nash, Texas; HDPE Stiffening Inserts by Romac Industries, Inc., Bothell, Washington; or approved equal.

## 2.02 EQUIPMENT:

- A. The equipment and the pipe bursting method selected by the Contractor shall be submitted as detailed in Paragraph 1.06-A.3 of this section and be operated in accordance with the manufacturers recommendation, unless modified herein. The pipe bursting tool shall be designed and manufactured to force its way through the existing pipe materials by fragmenting the pipe and compressing the old pipe sections into the surrounding soil as it progresses.
- B. The Contractor shall use pneumatically operated equipment with either front or rear expanders to prevent collapse of the hole ahead of the polyethylene pipe insertion. The pneumatic tool must be used in conjunction with a constant tension hydraulic twin capstan winch of either 20, 10, or 5 tons. In no case is the constant tension on the winch to exceed 20 tons. The winch shall have twin capstan with twin hydraulic drive motors and twin gear boxes for independent operation to control the pipe's stress and stretch during bursting.
- C. The pipe bursting tool shall be pneumatic. The bursting action of the tool shall increase the external dimensions sufficiently, causing breakage of the pipe at the same time expanding the surrounding ground. This action shall not only break the pipe but also create the void into which the burster can be winched and enables forward progress to be made. At the same time the polyethylene pipe, directly attached to the sleeve on the rear of the burster, shall also move forward. To form a complete operating system, the burster must be matched to a constant tension hydraulic winching system.

## PART 3 - EXECUTION

### 3.01 CONSTRUCTION METHOD:

- A. It is the Contractor's responsibility to assure that the host pipeline is sufficiently clean so as not to prohibit pipe bursting operations. The Engineer may require televising the line prior to commencing the pipe bursting operation. Cleaning required shall be conducted in accordance with Section 02440, SEWER CLEANING AND INSPECTION.
- B. Equipment used to perform the work shall be located away from buildings so as not to create noise impact. Provide a silent engine compartment with the winch to reduce machine noise as required to meet the Community Sound Level Criteria as established by the Commonwealth of Massachusetts' Department of Environmental Protection (DEP). Noise levels shall also comply with local Code of Ordinances.
- C. Contractor shall install pulleys, rollers, bumpers, alignment control devices and other equipment required to protect existing manholes, and to protect the pipe from damage during installation. Lubrication may be used as recommended by the manufacturer. Under no circumstances shall the replacement pipe be stressed beyond its elastic limit.
- D. A winch shall be attached to the front of the bursting unit, connecting to or through the schnooze. The winch shall provide a constant tension to the burster in order that it may operate in an efficient manner. The winch shall ensure directional stability in keeping the unit on line and control the pipe's stress and stretch during bursting.
- E. The location and number of launching and receiving pits shall be determined such that their number shall be minimized and the footage of the new pipe installed in a single pull shall be maximized.
- F. The supports to the trench shoring in the insertion pit shall remain completely separate from the winch boom support system and shall be so designed that neither the pipe nor the winch cable shall be in contact with them.
- G. All buried utilities adjacent to the pipe bursting operation shall be reviewed, and where necessary be excavated to relieve transient loading during the insertion operation. If any utilities are within 24-inches of the pipe to be burst, the Contractor shall excavate a pit at the location to check clearance.
- H. The new polyethylene pipe shall be inserted immediately behind the bursting head in accordance with the manufacturer's recommended procedures.
- I. The installed pipe shall be allowed the manufacturer's recommended amount of time, but not less than four (4) hours, for cooling and relaxation due to tensile stressing prior to any sealing of the annular space or backfilling of the insertion pit(s).
- J. Following the relaxation period, the new HDPE pipe shall be connected to the manhole with a watertight seal utilizing one of two methods:

1. The Contractor shall allow sufficient excess length of new HDPE pipe, but not less than four (4) inches, nor more than six (6) inches shall be allowed to protrude into the manhole.
  2. The Contractor shall connect the new HDPE pipe to the manhole by use of an appropriate length of pipe, of the same tensile strength equivalent to that being connected, and a solid sleeve coupling, as shown on the Drawings. The solid sleeve coupling shall be as specified herein or as recommended by the pipe manufacturer. Circumferential inside supports for the HDPE pipe ends, specified herein, shall be installed as recommended by the manufacturer and to prevent disturbance of the flow characteristics in the pipe.
- K. Manhole seals, as shown on the Drawings, shall be installed around the pipe to form a watertight seal between the pipe exterior and the manhole wall. The Contractor shall not complete the watertight seal to the manhole until the solid sleeve coupling has been fully installed.

### 3.02 BY-PASS PUMPING:

- A. At all pipe replacement locations; the flow shall be re-routed by by-pass pumping. By-pass pumping shall be as specified in Section 01575, HANDLING OF EXISTING FLOWS and Section 01535, TEMPORARY BYPASS PUMPING SYSTEM.

### 3.03 ACCESS PITS/LOCATIONS:

- A. The location and number of pits for access to the pipeline shall be as indicated on the contract drawings. If the Contractor wants to relocate any access pits, the Contractor shall submit in writing, for review and approval by the Engineer, the new proposed locations and reasons for relocation. The Contractor shall be responsible for obtaining all necessary permits outlined in Section 00890, PERMITS.
- B. Where manholes are used as access pits, the Contractor shall modify, repair, and/or replace such manholes at no additional cost to the Owner. All required modifications to the invert shall be made before the replacement operations by the Contractor at no additional cost to the Owner and shall be considered incidental to the work.
- C. The Contractor shall carry out operations relative to the access pit excavation in strict accordance with all applicable OSHA, local and state safety regulations.
- D. Any damage to adjacent properties that are not part of this work shall be repaired and restored to its original condition at no additional cost to the Owner.

### 3.04 PIPE JOINING:

- A. Polyethylene pipe shall be assembled and joined at the site using butt-fusion methods to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. All equipment and procedures used shall be in strict compliance with the



manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment.

- B. The butt-fused joint shall be true alignment and shall have uniform roll-back beads resulting from the use of proper temperature and pressure. Joints shall be allowed adequate cooling time before removal of pressure. Fused joints shall be watertight and shall have tensile strength equal to that of the pipe. All joints shall be subject to acceptance by the Engineer and/or his representative prior to insertion. All defective joints shall be cut out and replaced at no cost to the Owner. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness, shall not be used and must be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the procedures stated above. In addition, any section of the pipe having other defects such as concentrated ridges, discoloration, excessive spot roughness, pitting, variable wall thickness or any other defect of manufacturing or handling as determined by the Engineer and/or his representative shall be discarded and not used.
- C. Terminal sections of pipe that are joined within the insertion pit shall be connected with connectors with tensile strength equivalent to that of the pipe being joined.

#### 3.05 VIDEO INSPECTION:

- A. After the existing pipe section is completely replaced, internally inspect with television camera and videotape as required in Section 02440, SEWER CLEANING AND INSPECTION. The finished tape shall be continuous over the entire length of the replaced pipe section and to be free from visual defects.
- B. Defects, which may affect the integrity or strength of the pipe, shall be repaired or the pipe replaced at the Contractor's expense.

#### 3.06 LEAKAGE TESTING:

- A. On completion of video inspection of a section of pipe replacement, the Contractor shall install suitable bulkheads as required, dewater, and test the pipeline for leakage.
- B. Unless otherwise approved, the section shall be tested using low pressure air test procedures.
- C. The Contractor shall provide suitable temporary testing plugs or caps; all necessary pressure pumps, pipe connections, meters, and other necessary equipment; and all labor required at no expense to the Owner. The Owner or Engineer shall have the privilege of using his or her own gages.
- D. The air test procedures shall conform to the Recommended Practice for Low Pressure Air Testing of Installed Sewer Pipe - UNI-B-6. The starting air pressure for the test shall be 4 psig greater than the average back pressure [2 psig] on the pipe, and the maximum pressure drop allowed shall not exceed 0.5 psig. The minimum duration permitted for the prescribed low-pressure air exfiltration pressure drop between two consecutive manholes shall not be less than provided in Table below:

Pipe Diameter =	8" & Smaller	10 inch	12 inch	15 inch or more
Min. Elapsed Time =	4 minutes	5 minutes	6 minutes	7 minutes

- E. If the section fails to pass the pressure, the Contractor shall do everything necessary to locate, uncover, and repair or replace the defective pipe or joint, all at his own expense and without extension of time for completion of the work. Additional tests and repairs shall be made until the section passes the specified test.

### 3.07 CLEANUP:

- A. Refer to Section 01740, CLEANING UP

### END OF SECTION

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## SECTION 02240

### DEWATERING

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This section specifies designing, furnishing, installing, maintaining, operating and removing temporary dewatering systems as required to lower and control water levels and hydrostatic pressures during construction; disposing of pumped water; constructing, maintaining, observing and, except where indicated or required to remain in place, removing of equipment and instrumentation for control of the system.

##### 1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01570, ENVIRONMENTAL PROTECTION
- C. Section 02252, SUPPORT OF EXCAVATION
- D. Section 02300, EARTHWORK

##### 1.03 SYSTEM DESCRIPTION:

- A. Dewatering includes lowering the water table and intercepting seepage which would otherwise emerge from the slopes or bottom of the excavation; increasing the stability of excavated slopes; preventing loss of material from beneath the slopes or bottom of the excavation; reducing lateral loads on sheeting and bracing; improving the excavation and hauling characteristics of sandy soil; preventing rupture or heaving of the bottom of any excavation; and disposing of pumped water.

##### 1.04 QUALITY ASSURANCE:

- A. The Contractor is responsible for the adequacy of the dewatering systems.
- B. The dewatering systems shall be capable of effectively reducing the hydrostatic pressure and lowering the groundwater levels to a minimum of two (2) feet below excavation bottom, unless otherwise required by the Engineer, so that all excavation bottoms are firm and dry.
- C. The dewatering system shall be capable of maintaining a dry and stable subgrade until the structures, pipes and appurtenances to be built therein have been completed to the extent that they will not be floated or otherwise damaged.

- D. The dewatering system and excavation support (see Section 02252, SUPPORT OF EXCAVATION) shall be designed so that lowering of the groundwater level outside the excavation does not adversely affect adjacent structures, utilities or wells.

#### 1.05 SUBMITTALS:

- A. Contractor shall submit six (6) copies of a plan indicating how they intend to control the discharge from any dewatering operations on the project, whether it is discharge of groundwater from excavations or stormwater runoff during the life of the project.

### PART 2 - PRODUCTS

Not applicable.

### PART 3 - EXECUTION

#### 3.01 DEWATERING OPERATIONS:

- A. All water pumped or drained from the work shall be disposed of in a manner that will not result in undue interference with other work or damage to adjacent properties, pavements and other surfaces, buildings, structures and utilities. Suitable temporary pipes, flumes or channels shall be provided for water that may flow along or across the site of the work. All disposal of pumped water shall conform to the provisions of Section 01570, ENVIRONMENTAL PROTECTION and Section 00890, PERMITS.
- B. Dewatering facilities shall be located where they will not interfere with utilities and construction work to be done by others.
- C. Dewatering procedures to be used shall be as described below:
  - 1. Crushed stone shall encapsulate the suction end of the pump to aid in minimizing the amount of silt discharged.
  - 2. For dewatering operations with relatively minor flows, pump discharges shall be directed into hay bale sedimentation traps lined with filter fabric. Water is to be filtered through the straw bales and filter fabric prior to being allowed to seep out into its natural watercourse.
  - 3. For dewatering operations with larger flows, pump discharges shall be into a steel dewatering basin. Steel baffle plates shall be used to slow water velocities to increase the contact time and allow adequate settlement of sediment prior to discharge into waterways.
  - 4. Where indicated on the contract drawings or in conditions of excess silt suspended in the discharge water, silt control bags shall be utilized in catch basins.

- D. The Contractor shall be responsible for repair of any damage caused by his dewatering operations, at no cost to the Owner.

END OF SECTION

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## SECTION 02252

### SUPPORT OF EXCAVATION

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This section of the specification covers wood sheeting and bracing for support of excavations. The requirements of this section shall also apply, as appropriate, to other methods of excavation support and underpinning which the Contractor elects to use to complete the work.
- B. The Contractor shall furnish and place timber sheeting of the kinds and dimensions required, complying with these specifications, where indicated on the drawings or required by the Engineer.

##### 1.02 RELATED WORK:

- A. Section 02240, DEWATERING
- B. Section 02300, EARTHWORK

##### 1.03 QUALITY ASSURANCE:

- A. This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Massachusetts Department of Safety and Department of Labor, Division of Occupational Safety "Excavation & Trench Safety Regulation (520 CMR 14.00)" and "Rules and Regulations for the Prevention of Accidents in Construction Operations (454 CMR 10.0 et seq.)." Contractors shall be familiar with the requirements of these regulations.
- B. The excavation support system shall be of sufficient strength and be provided with adequate bracing to support all loads to which it will be subjected. The excavation support system shall be designed to prevent any movement of earth that would diminish the width of the excavation or damage or endanger adjacent structures.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS:

- A. Timber sheeting shall be sound spruce, pine, or hemlock, planed on one side and either tongue and grooved or splined. Timber sheeting shall not be less than nominal 2-inches thick.
- B. Timber and steel used for bracing shall be of such size and strength as required in the excavation support design. Timber or steel used for bracing shall be new or undamaged

used material which does not contain splices, cutouts, patches, or other alterations which would impair its integrity or strength.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION:

- A. Work shall not be started until all materials and equipment necessary for their construction are either on the site of the work or satisfactorily available for immediate use as required.
- B. The sheeting shall be securely and satisfactorily braced to withstand all pressures to which it may be subjected and be sufficiently tight to minimize lowering of the groundwater level outside the excavation, as required in Section 02240, DEWATERING.
- C. The sheeting shall be driven by approved means to the design elevation. No sheeting may be left so as to create a possible hazard to safety of the public or a hindrance to traffic of any kind.
- D. If boulders or very dense soils are encountered, making it impractical to drive a section to the desired depth, the section shall, as required, be cut off.
- E. The sheeting shall be left in place where indicated on the drawings or required by the Engineer in writing. At all other locations, the sheeting may be left in place or salvaged at the option of the Contractor. Steel or wood sheeting permanently left in place shall be cut off at a depth of not less than two feet below finish grade unless otherwise required.
- F. All cut-off will become the property of the Contractor and shall be removed by him from the site.
- G. Responsibility for the satisfactory construction and maintenance of the excavation support system, complete in place, shall rest with the Contractor. Any work done, including incidental construction, which is not acceptable for the intended purpose shall be either repaired or removed and reconstructed by the Contractor at his expense.
- H. The Contractor shall be solely responsible for repairing all damage associated with installation, performance, and removal of the excavation support system.

END OF SECTION

## SECTION 02300

### EARTHWORK

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

The Contractor shall make excavations of normal depth in earth for trenches and structures, shall backfill and compact such excavations to the extent necessary, shall furnish the necessary material and construct embankments and fills, and shall make miscellaneous earth excavations and do miscellaneous grading as required by the contract drawings.

##### 1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01110, CONTROL OF WORK AND MATERIALS
- C. Section 01570, ENVIRONMENTAL PROTECTION
- D. Section 02240, DEWATERING
- E. Section 02252, SUPPORT OF EXCAVATION
- F. Section 02324, ROCK EXCAVATION AND DISPOSAL
- G. Section 02745, PAVING
- H. Section 02920, LOAMING AND SEEDING

##### 1.03 REFERENCES:

###### American Society for Testing and Materials (ASTM)

ASTM	C131	Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
ASTM	C136	Method for Sieve Analysis of Fine and Coarse Aggregates.
ASTM	C330	Specification for Lightweight Aggregate for Structural Concrete.
ASTM	D1556	Test Method for Density of Soil in Place by the Sand Cone Method.



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|------|-------|--|
| ASTM | D1557 | Test Methods for Moisture-density Relations of Soils and Soil Aggregate Mixtures Using Ten-pound (10 Lb.) Hammer and Eighteen-inch (18") Drop. |
| ASTM | D2922 | Test Methods for Density of Soil and Soil-aggregate in Place by Nuclear Methods (Shallow Depth).   |

Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges.

Code of Massachusetts Regulations (CMR) 310.40.0032 Contaminated Media and Contaminated Debris

Code of Massachusetts Regulations (CMR) 520 CMR 14.00 Excavation & Trench Safety Regulation

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Samples of all materials proposed for the project shall be submitted to the Engineer for review. Size of the samples shall be as approved by the Engineer.

1.05 PROTECTION OF EXISTING PROPERTY:

- A. The work shall be executed in such manner as to prevent any damage to facilities at the site and adjacent property and existing improvements, such as but not limited to streets, curbs, paving, service utility lines, structures, monuments, bench marks, observation wells, and other public or private property. Protect existing improvements from damage caused by settlement, lateral movements, undermining, washout and other hazards created by earthwork operations.
- B. In case of any damage or injury caused in the performance of the work, the Contractor shall, at its own expense, make good such damage or injury to the satisfaction of, and without cost to, the Owner. Existing roads, sidewalks, and curbs damaged during the project work shall be repaired or replaced to at least the condition that existed at the start of operations. The Contractor shall replace, at his own cost, existing benchmarks, observation wells, monuments, and other reference points, which are disturbed or destroyed.
- C. Buried drainage structures and pipes, observation wells and piezometers, including those which project less than eighteen inches (18") above grade, which are subject to damage from construction equipment shall be clearly marked to indicate the hazard. Markers shall indicate limits of danger areas, by means which will be clearly visible to operators of trucks and other construction equipment, and shall be maintained at all times until completion of project.

1.06 DRAINAGE:

- A. The Contractor shall provide, at its own expense, adequate drainage facilities to complete all work items in an acceptable manner. Drainage shall be done in a manner so that runoff will not adversely affect construction procedures or cause excessive disturbance of underlying natural ground or abutting properties.

1.07 FROST PROTECTION AND SNOW REMOVAL:

- A. The Contractor shall, at its own expense, keep earthwork operations clear and free of accumulations of snow as required to carry out the work.
- B. The Contractor shall protect the subgrade beneath new structures and pipes from frost penetration when freezing temperatures are expected.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. GRAVEL BORROW:

Gravel Borrow shall satisfy the requirements listed in MassDOT Specification Section M1.03.0, Type B.

B. CRUSHED STONE:

Crushed stone shall satisfy the requirements listed in MassDOT Specification Section M2.01.2 (1½-inch crushed stone).

C. SAND BORROW:

Sand Borrow shall satisfy the requirements listed in MassDOT Specification Section M1.04.0.

D. PEASTONE:

Peastone shall be smooth, hard, naturally occurring, rounded stone meeting the following gradation requirements:

Passing 5/8 inch square sieve opening	-	100%
Passing No. 8 sieve opening	-	0%

E. BACKFILL MATERIALS:

1. Class B Backfill:

Class B backfill shall be granular, well graded friable soil; free of rubbish, ice, snow, tree stumps, roots, clay and organic matter; with 30 percent or less passing the No.

200 sieve; no stone greater than two-third (2/3) loose lift thickness, or six (6) inches, whichever is smaller.

2. Select Backfill:

Select backfill shall be granular, well graded friable soil, free of rubbish, ice, snow, tree stumps, roots, clay and organic matter, and other deleterious or organic material; graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
3-inch	100
No. 10	30-95
No. 40	10-70
No. 200	0-10

F. PROCESSED GRAVEL:

1. Processed gravel shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.
2. The gradation shall meet the following requirements:

<u>Sieve Designation</u>	<u>Percentage Passing</u>
3-in.	100
1 ½-in.	70-100
¾-in.	50-85
No. 4	30-60
No. 200	0-10

3. The approved source of bank-run gravel material shall be processed by mechanical means. The equipment for producing crushed gravel shall be of adequate size with sufficient adjustments to produce the desired materials. The processed material shall be stockpiled in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.

G. STONE FILL FOR GABIONS:

1. The stone for gabions shall be hard, angular to round, durable and of such quality that they will not disintegrate on exposure to water or weathering during the life of the structure. Gabion rocks shall range between 4-inches and 8-inches. The range in sizes may allow for a variation of five (5) percent oversize and/or five (5) percent undersize rock, provided it is not placed on the gabion-exposed surface. The size shall be such that a minimum of two layers of rock must be achieved when filling the gabion.

### PART 3 - EXECUTION

#### 3.01 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION:

- A. Contractor shall take the necessary steps to avoid disturbance of subgrade during excavation and filling operations, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials, dewatering and other acceptable control measures.
- B. All excavated or filled areas disturbed during construction, all loose or saturated soil, and other areas that will not meet compaction requirements as specified herein shall be removed and replaced with a minimum 12-inch layer of compacted crushed stone wrapped all around in non-woven filter fabric. Costs of removal and replacement shall be borne by the Contractor.
- C. The Contractor shall place a minimum of 12-inch layer of special bedding materials and crushed stone wrapped in filter fabric over the natural underlying soil to stabilize areas which may become disturbed as a result of rain, surface water runoff or groundwater seepage pressures, all at no additional cost to the Owner. The Contractor also has the option of drying materials in-place and compacting to specified densities.

#### 3.02 EXCAVATION:

##### A. GENERAL:

- 1. The Contractor shall perform all work of any nature and description required to accomplish the work as shown on the Drawings and as specified.
- 2. Excavations, unless otherwise required by the Engineer, shall be carried only to the depths and limits shown on the Drawings. If unauthorized excavation is carried out below required subgrade and/or beyond minimum lateral limits shown on Drawings, it shall be backfilled with gravel borrow and compacted at the Contractor's expense as specified below, except as otherwise indicated. Excavations shall be kept in dry and good conditions at all times, and all voids shall be filled to the satisfaction of the Engineer.
- 3. In all excavation areas, the Contractor shall strip the surficial topsoil layer and underlying subsoil layer separate from underlying soils. In paved areas, the Contractor shall first cut pavement as specified in paragraph 3.02 B.1 of this specification, strip pavement and pavement subbase separately from underlying soils. All excavated materials shall be stockpiled separately from each other within the limits of work.
- 4. The Contractor shall follow a construction procedure, which permits visual identification of stable natural ground. Where groundwater is encountered, the size of the open excavation shall be limited to that which can be handled by the

Contractor's chosen method of dewatering and which will allow visual observation of the bottom and backfill in the dry.

5. The Contractor shall excavate unsuitable materials to stable natural ground where encountered at proposed excavation subgrade, as required by the Engineer. Unsuitable material includes topsoil, loam, peat, other organic materials, snow, ice, and trash. Unless specified elsewhere or otherwise required by the Engineer, areas where unsuitable materials have been excavated to stable ground shall be backfilled with compacted special bedding materials or crushed stone wrapped all around in non-woven filter fabric.

**B. TRENCHES:**

1. Prior to excavation, trenches in pavement shall have the traveled way surface cut in a straight line by a concrete saw or equivalent method, to the full depth of pavement. Excavation shall only be between these cuts. Excavation support shall be provided as required to avoid undermining of pavement. Cutting operations shall not be done by ripping equipment.
2. The Contractor shall satisfy all dewatering requirements specified in Section 02240, DEWATERING, before performing trench excavations.
3. Trenches shall be excavated to such depths as will permit the pipe to be laid at the elevations, slopes, and depths of cover indicated on the Drawings. Trench widths shall be as shown on the Drawings or as specified.
4. Where pipe is to be laid in bedding material, the trench may be excavated by machinery to, or just below, the designated subgrade provided that the material remaining in the bottom of the trench is not disturbed.
5. If pipe is to be laid in embankments or other recently filled areas, the fill material shall first be placed to a height of at least 12-inches above the top of the pipe before excavation.
6. Pipe trenches shall be made as narrow as practicable and shall not be widened by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed.
7. If, in the opinion of the Engineer, the subgrade, during trench excavation, has been disturbed as a result of rain, surface water runoff or groundwater seepage pressures, the Contractor shall remove such disturbed subgrade to a minimum of 12-inches and replace with crushed stone wrapped in filter fabric. Cost of removal and replacement shall be borne by the Contractor.
8. The Contractor shall obtain a trench permit from the municipality where the trench is located prior to making any excavations of trenches (any subsurface excavation greater than three (3) feet in depth and fifteen (15) feet or less between soil walls as measured from the bottom).

9. All trenches required to be permitted must be attended, covered, barricaded, or backfilled. Covers must be road plates at least ¾-inch thick or equivalent, barricades must be fences at least 6-feet high with no openings greater than 4-inches between vertical supports and all horizontal supports required to be located on the trench-side of the fencing.

C. EXCAVATION NEAR EXISTING STRUCTURES:

1. Attention is directed to the fact that there are pipes, manholes, drains, and other utilities in certain locations. An attempt has been made to locate all utilities on the drawings, but the completeness or accuracy of the given information is not guaranteed.
2. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and excavation shall be done by means of hand tools, as required. Such manual excavation, when incidental to normal excavation, shall be included in the work to be done under items involving normal excavation.
3. Where determination of the exact location of a pipe or other underground structure is necessary for properly performing the work, the Contractor shall excavate test pits to determine the locations.

3.03 BACKFILL PLACEMENT AND COMPACTION:

A. GENERAL:

1. Prior to backfilling, the Contractor shall compact the exposed natural subgrade to the densities as specified herein.
2. After approval of subgrade by the Engineer, the Contractor shall backfill areas to required contours and elevations with specified materials.
3. The Contractor shall place and compact materials to the specified density in continuous horizontal layers, not to exceed nine (9) inches in uncompacted lifts. The degree of compaction shall be based on maximum dry density as determined by ASTM Test D1557, Method C. The minimum degree of compaction for fill placed shall be as follows:

<u>Location</u>	<u>Percent of Maximum Density</u>
Below pipe centerline	95
Above pipe centerline	92
Below pavement (upper 3 ft.)	95
Embankments	95
Below pipe in embankments	95
Adjacent to structures	92
Below structures	95

4. The Engineer reserves the right to test backfill for conformance to the specifications and Contractor shall assist as required to obtain the information. Compaction testing will be performed by the Engineer or by an inspection laboratory designated by the Engineer, engaged and paid for by the Owner. If test results indicate work does not conform to specification requirements, the Contractor shall remove or correct the defective Work by recompacting where appropriate or replacing as necessary and approved by the Engineer, to bring the work into compliance, at no additional cost to the Owner. All backfilled materials under structures and buildings shall be field tested for compliance with the requirements of this specification.
5. Where horizontal layers meet a rising slope, the Contractor shall key each layer by benching into the slope.
6. If the material removed from the excavation is suitable for backfill with the exception that it contains stones larger than permitted, the Contractor has the option to remove the oversized stones and use the material for backfill or to provide replacement backfill at no additional cost to the Owner.
7. The Contractor shall remove loam and topsoil, loose vegetation, stumps, large roots, etc., from areas upon which embankments will be built or areas where material will be placed for grading. The subgrade shall be shaped as indicated on the Drawings and shall be prepared by forking, furrowing, or plowing so that the first layer of the fill material placed on the subgrade will be well bonded to the subgrade.
8. Where required by the Engineer, Lightweight Fill shall be placed and compacted as recommended by the manufacturer. The exact number of passes shall be approved by the Engineer to insure stability of the layer. As soon as the compaction of each layer has been completed, the next layer shall then be placed. The Contractor shall take all necessary precautions during construction activities in operations on or adjacent to the Lightweight Fill to insure that the material is not over-compacted. Construction equipment, other than for compaction, shall not operate on the exposed Lightweight Fill. The top surface of the Lightweight Fill lying directly below the gravel course shall be chinked by additional rolling of the Lightweight Fill to prevent infiltration of fines.

**B. TRENCHES:**

1. Bedding as detailed and specified shall be furnished and installed beneath the pipeline prior to placement of the pipeline. A minimum bedding thickness shall be maintained between the pipe and undisturbed material, as shown on the Drawings.
2. As soon as practicable after pipes have been laid, backfilling shall be started.
3. Unless otherwise indicated on the Drawings, select backfill shall be placed by hand shovel in 6-inch thick lifts up to a minimum level of 12-inches above the top of pipe. This area of backfill is considered the zone around the pipe and shall be

thoroughly compacted before the remainder of the trench is backfilled. Compaction of each lift in the zone around the pipe shall be done by use of power-driven tampers weighing at least 20 pounds or by vibratory compactors. Care shall be taken that material close to the bank, as well as in all other portions of the trench, is thoroughly compacted to densities required.

4. Class B backfill shall be placed from the top of the select backfill to the specified material at grade (loam, pavement subbase, etc.). Fill compaction shall meet the density requirements of this specification.
5. Water Jetting:
  - a. Water jetting may be used when the backfill material contains less than 10 percent passing the number 200 sieve, but shall be used only if approved by the Engineer.
  - b. Contractor shall submit a detailed plan describing the procedures he intends to use for water jetting to the Engineer for approval prior to any water jetting taking place.
  - c. Compaction of backfill placed by water jetting shall conform to the requirements of this specification.
6. If the materials above the trench bottom are unsuitable for backfill, the Contractor shall furnish and place backfill materials meeting the requirements for trench backfill, as shown on the drawings or specified herein.
7. Should the Engineer order crushed stone for utility supports or for other purposes, the Contractor shall furnish and install the crushed stone as directed.
8. In shoulders of streets and road, the top 12-inch layer of trench backfill shall consist of processed gravel for sub-base, satisfying the requirements listed in MassDOT standard specification M1.03.1.

**C. BACKFILLING ADJACENT TO STRUCTURES:**

1. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads to which they will be subjected. Excavated material approved by the Engineer may be used in backfilling around structures. Backfill material shall be thoroughly compacted to meet the requirements of this specification.
2. Contractor shall use extra care when compacting adjacent to pipes and drainage structures. Backfill and compaction shall proceed along sides of drainage structures so that the difference in top of fill level on any side of the structure shall not exceed two feet (2') at any stage of construction.



3. Where backfill is to be placed on only one side of a structural wall, only hand-operated roller or plate compactors shall be used within a lateral distance of five feet (5') of the wall for walls less than fifteen feet (15') high and within ten feet (10') of the wall for walls more than fifteen feet (15') high.

#### 3.04 DISPOSAL OF SURPLUS MATERIALS:

- A. Surplus excavated materials, which are acceptable to the Engineer, shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill. Upon written approval of the Engineer, surplus excavated materials shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes as indicated by the Owner, within its jurisdictional limits; all at no additional cost to the Owner.
- B. Surplus excavated material not needed as specified above shall be hauled away and disposed of by the Contractor at no additional cost to the Owner, at appropriate locations, and in accordance with arrangements made by him. Disposal of all rubble shall be in accordance with all applicable local, state and federal regulations.
- C. No excavated material shall be removed from the site of the work or disposed of by the Contractor unless approved by the Engineer.
- D. The Contractor shall comply with Massachusetts regulations (310 CMR 40.0032) that govern the removal and disposal of surplus excavated materials. Materials, including contaminated soils, having concentrations of oil or hazardous materials less than an otherwise Reportable Concentration and that are not a hazardous waste, may not be disposed of at locations where concentrations of oil and/or hazardous material at the receiving site are significantly lower than the levels of those oil and /or hazardous materials present in the soil being disposed or reused.

#### END OF SECTION

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## SECTION 02324

### ROCK EXCAVATION AND DISPOSAL

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

The Contractor shall excavate rock, if encountered, to the lines and grades indicated on the drawings or as required, shall dispose of the excavated material, and shall furnish the required material as specified in Section 02300, EARTHWORK for backfill in place of the excavated rock.

##### 1.02 RELATED WORK:

- A. Section 02252, SUPPORT OF EXCAVATION
- B. Section 02300, EARTHWORK
- C. Section 03302, FIELD CONCRETE

##### 1.03 DEFINITIONS:

- A. The word "rock," wherever used as the name of the excavated material or material to be excavated, shall mean only boulders and pieces of concrete or masonry exceeding one (1) cubic yard in volume, or solid ledge rock which, in the opinion of the Engineer, requires for its removal, drilling and blasting, wedging, sledging, barring, or breaking up with a power-operated tool. No soft or disintegrated rock which can be removed by normal earth excavation methods, no loose, shaken, or previously blasted rock or broken stone in rock fillings or elsewhere, and no rock exterior to the maximum limits of measurement allowed, which may fall into the excavation, will be measured or allowed as "rock."
- B. The word "earth," wherever used as the name of an excavated material or material to be excavated, shall mean all kinds of material other than rock as above defined.

##### 1.04 QUALITY ASSURANCE:

- A. The Contractor shall conform to all municipal ordinances and state and federal laws relating to the transportation, storage, handling, and use of explosives. In the event that any of the above mentioned laws, ordinances, or regulations require a licensed blaster to perform or supervise the work of blasting, said licensed blaster shall, at all times, have his license on the work site and shall permit examination thereof by the Engineer or other officials having jurisdiction.
- B. The Contractor shall procure all permits required for blasting.

1.05 SUBMITTALS:

- A. At least two (2) weeks before beginning blasting operations, the Contractor shall submit to the Engineer for record the following data:
  - 1. Name of Contractor or Subcontractor responsible for blasting and monitoring operations and license number.
  - 2. Name, affiliation, and license number of the person or persons who will be directly responsible for designing each blast, supervising the loading of the shot, and firing it.
- B. Copies of all permits required for blasting.
- C. Results of pre-blast survey.
- D. When blasting is in progress, daily reports on blasting operations and blast monitoring results.

1.06 DELIVERY/STORAGE AND HANDLING:

Delivery, storage and handling of explosives shall conform to all federal, state and local regulations and permits.

PART 2 – PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.01 PREPARATION/PRE-BLAST SURVEY:

If required, the pre-blast survey shall be conducted in accordance with state regulations and/or local permit requirements.

3.02 EXCAVATION:

- A. The Contractor shall excavate rock to the lines and grades indicated on the drawings or as required by the Engineer. The excavated rock shall be removed and disposed of by the Contractor as specified for surplus excavated materials under Section 02300, EARTHWORK.
- B. Work damaged by blasting shall be repaired or replaced at the Contractor's expense.
- C. If rock is excavated beyond the limits of payment indicated on the drawings, specified, or authorized in writing by the Engineer, the excess excavation, whether resulting from overbreakage or other causes, shall be backfilled, by and at the expense of the Contractor, as specified below:

1. In pipe trenches, excess excavation shall be filled with the required material and compacted in the same manner as specified for the material in the zone around the pipe under Section 02300, EARTHWORK.
  2. In excavations for structures, excess excavation in the rock beneath foundations shall be filled with concrete which shall have a minimum 28-day compressive strength of 3000 psi. Other excess excavation shall be filled with Class B backfill compacted to a minimum of 92 percent density (ASTM D1557 Method C) as specified under Section 02300, EARTHWORK.
  3. If the rock below normal depth is shattered due to drilling or blasting operations of the Contractor, and the Engineer considers such shattered rock to be unfit for foundations, the shattered rock shall be removed and the excavation shall be backfilled with concrete as required, except that in pipe trenches crushed stone may be used for backfill, if approved. All such removal and backfilling shall be done by and at the expense of the Contractor.
- D. When required by the Engineer, the Contractor shall remove all dirt and loose rock from designated areas and shall clean the surface of the rock thoroughly to determine whether seams or other defects exist.
- E. When concrete is to be placed on rock, the rock shall be free of all vegetation, dirt, sand, clay, boulders, scale, excessively cracked rock, loose fragments, water, ice, snow, and other objectionable substances.

3.03 VIBRATION AND AIR BLAST MONITORING:

- A. The Contractor shall measure air blast and vibration levels of blasting operations to assure compliance with all applicable regulations and local permits.
- B. Records of each day's air blast and vibration measurements shall be submitted to the Engineer in writing no later than the start of the next day's work. Records shall include, as a minimum:
- Identification of instrument
  - Name of observer
  - Name of interpreter
  - Distance and direction of recording station from the area of detonation
  - Date and exact time of reading
  - Type of ground at recording station

- Peak particle velocity for all components as well as resultant for all frequencies of vibrations
- Duration of motion with a velocity in excess of one thousandth of an inch per second
- A copy of the photographic record of seismograph readings
- Peak air blast level.

#### 3.04 BLASTING RECORDS:

The Contractor shall prepare and submit to the Engineer daily blast reports, including logs of each blast. Reports shall be submitted to the Engineer no later than the start of the next day's work. However, during each day of blasting, the Contractor shall review and shall provide access for the Engineer to review the data from that day's blasting. Reports after each blast shall include at least the following information for each blast:

- Date, time, and location of blast
- Permit number and expiration date
- Amount and type of explosives used by weight and number of cartridges
- Total number of delays used and number of holes used for each delay
- On a diagram of the blast pattern, indicate total number and depth of holes, maximum charge per delay, maximum charge per hole, and corresponding delay number
- An evaluation of the blast indicating areas of significant overbreak, unusual results, and any recommended adjustments for the next blast.

#### 3.05 POST BLASTING INSPECTIONS:

The Contractor shall examine any properties, structures, and conditions where complaints of damage have been received or damage claims have been filed. Advance notice shall be given to all interested parties so that the parties may be present during the final examination. Records of the final examination shall be signed and distributed to the owner of the property, the head of the local fire department, and the Engineer.

END OF SECTION

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## SECTION 02427

### POST CONSTRUCTION FLOW ISOLATION

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This Section covers all materials, equipment, and labor required to conduct flow isolation on individual sewer reaches.

##### 1.02 RELATED WORK:

A. Section 01330, SUBMITTALS

B. Section 01575, HANDLING EXISTING FLOWS

##### 1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

1. The Owner shall provide the Contractor with a Microsoft Excel Table with all manhole-to-manhole information pre-entered. The table will have blank fields to record each flow isolation reading. The contractor shall complete the table with the data collected during the flow isolation procedure. Any observed infiltration from manholes shall be noted in the Table and shall not be included in the measured manhole-to-manhole value.

#### PART 2 – PRODUCTS

Not applicable.

#### PART 3 - EXECUTION

##### 3.01 FLOW ISOLATION:

- A. Following the completion of all rehabilitation work, flow isolation shall be conducted by the Contractor on all sewer reaches that are rehabilitated during the project. Readings shall be recorded one (1) manhole-to-manhole segment at a time, unless otherwise required by the Engineer.
- B. Individual manhole to manhole sewer segments shall be flow isolated by plugging flow at the upstream manhole and taking weir measurements at the downstream manhole using portable, precalibrated weirs.
- C. Flow isolation shall be performed between the hours of 12:00AM and 6:00AM during periods of high ground water and dry weather. The Engineer will determine if the

groundwater and weather conditions are appropriate to conduct flow isolation. If the conditions are not appropriate, the Engineer may require that flow isolation be completed as part of the “One Year” warranty inspection process.

- D. The manhole numbering system as indicated on the contract drawings shall be used to identify the manhole-to-manhole reaches that are flow isolated.

#### END OF SECTION

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## SECTION 02428

### CURED-IN-PLACE PIPE (Manhole to Manhole)

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This section covers installation of cured-in-place pipe as called for herein and on the drawings. The work includes furnishing all equipment, material, and labor required to perform the services described herein.

##### 1.02 RELATED WORK:

- A. Section 00331, TV INSPECTION AND MH INSPECTION REPORTS PROVIDED BY THE OWNER
- B. Section 00890, PERMITS
- C. Section 01014, SCOPE AND SEQUENCE OF WORK
- D. Section 01140, SPECIAL PROVISIONS
- E. Section 01330, SUBMITTALS
- F. Section 01331, DOCUMENTATION
- G. Section 01575, HANDLING EXISTING FLOWS
- H. Section 02440, SEWER CLEANING AND INSPECTION
- I. Section 02443, SERVICE CONNECTION REHABILITATION

##### 1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.



1.04 REFERENCES:

The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM F1216 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

The National Association of Sewer Service Companies (NASSCO)

Performance Specification Guideline for the Installation of Cured-in-Place Pipe (CIPP)

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, installation of cured-in-place pipe shall be carried out in accordance with ASTM F1216, Section 7.
- B. Curing of liner tube using hot water or steam shall be acceptable.
- C. The Contractor shall design all cured-in-place liners assuming partially deteriorated pipe conditions and a groundwater height above the crown of the pipe equal to one-half (50%) of the distance between the ground surface and the invert of the sanitary sewer line to be rehabilitated unless otherwise noted below.
- D. The Contractor may propose alternative cured-in-place processes and/or products for review and approval by the Engineer.
- E. The location, length, and approximate interior dimensions of the cured-in-place pipe to be installed are as shown on the drawings.
- F. The Contractor shall provide Material Safety Data Sheets (MSDS) for all chemicals used in the lining process.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit six (6) sets of the following:
  - 1. Qualifications of the firm/personnel who will perform the Work.
  - 2. Descriptions of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
  - 3. Description of the system, equipment and material proposed for the cured-in-place pipe.

4. Manufacturer's warranty.

- B. Prior to beginning the work, the Contractor shall submit, a written plan for contacting homeowners whose service connections may be affected due to the installation of liner. Such plan is subject to approval by the Engineer and the Owner.
- C. The Contractor shall submit the following information for each inversion within 21 days following completion of the liner installation;
  - Pre-inversion television inspection logs and DVDs (Video files shall also be included on external hard drives as described in Section 01331, DOCUMENTATION)
  - Liner order sheet describing the material ordered
  - Service connection reinstatement sign-off sheet
  - Thermo couple log kept during inversion process
  - Post-inversion television inspection logs and DVDs (Video files shall also be included on external hard drives as described in Section 01331, DOCUMENTATION)
  - Material testing results

Information should be organized by inversion and two (2) copies shall be delivered.

1.07 WARRANTY:

The cured-in-place pipe shall be warranted against infiltration and faulty workmanship and materials for one (1) year from the date the project is accepted by the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Materials used for the cured-in-place pipe shall meet the requirements of ASTM F1216.
- B. Cured-in-place pipe shall be as manufactured by Insituform Technologies, National Liner, Cure-Line, or approved equal.
- C. Hydrophilic rubber gaskets shall have two (2) beads of material protruding from one side of the strip and shall swell to a minimum of three (3) times its dry size when in contact with water. Flat types of gaskets shall not be accepted. Gaskets shall be a manufactured by Hydrotite or approved equal.

PART 3 - EXECUTION

3.01 PIPE CLEANING AND INSPECTION:

Pipe cleaning and inspection shall be carried out in accordance with Section 02440, SEWER CLEANING AND INSPECTION and shall not be measured separately for payment.

3.02 FLOW CONTROL:

Flow control, if required, shall be in accordance with Section 01575, HANDLING EXISTING FLOWS.

3.03 WATER FOR CONSTRUCTION PURPOSES:

Availability of water for construction purposes shall be in accordance with Section 01140, SPECIAL PROVISIONS.

3.04 NOTIFICATION:

- A. The Contractor shall affix a written notice to the door of each home that has sewer service through the pipe being lined one (1) week prior to the lining operation and again one (1) day before the lining operation. A notice shall also be distributed following service connection reinstatement stating that the service connection has been restored to service.
- B. The written notice must be approved by the Engineer prior to its distribution.
- C. The printing and distribution of notices to the homeowners by the Contractor shall be considered incidental to the lining operation.

3.05 INSTALLATION:

- A. Each sewer segment shall be television inspected prior to the installation of the cured-in-place liner. The inspection shall be performed in “dry-pipe” conditions with no flow in the pipe. The pipe shall be clean and free of all obstructions prior to installation of the liner.
- B. Prior to installation of the cured-in-place pipe the Contractor shall install a hydrophilic rubber gasket on the inside of each pipe where it meets a manhole such that the hydrophilic rubber gasket is between the host pipe and the cured-in-place pipe. The annular space shall be made watertight at the ends of the liner in the manholes.
- C. Installation of the cured-in-place pipe shall be in accordance with ASTM F1216, Section 7.
- D. After the liner has been cured in place, the Contractor shall reinstate all active service connections as required by the Engineer. Branch connections to buildings shall be reinstated to a minimum of 95% of the inside diameter of the existing service connection without excavation, utilizing a remotely controlled cutting device, monitored by a video TV camera. No additional payment will be made for excavations for the purpose of reinstating connections and the contractor will be responsible for all cost and liability associated with such excavation and restoration work. Service connection reinstatement shall be considered incidental to the lining process and shall not be measured separately for payment.

- E. The service connections to be reinstated for each inversion will be listed on the attached form (Service Connection Reinstatement Certification Form) and will be signed by an authorized representative of the Contractor.
- F. The Contractor shall make a mainline television inspection camera available for confirming service connections to be reinstated. At the Engineer's discretion, the Contractor shall dye test service connections in order to confirm that each service connection that should be reinstated is included on the attached Service Connection Reinstatement Certification Form. No additional payment will be made for television inspection in conjunction with dye testing of service connections.
- G. All reinstated service connections shall be sealed with grout in accordance with Section 02443, SERVICE CONNECTION REHABILITATION. The Contractor shall make certain that the annular space between the host pipe and the cured-in-place pipe is fully sealed with grout.
- H. Each sewer segment shall be television inspected after the liner installation and service grouting have been completed. The inspection shall be performed in "dry-pipe" conditions with no flow in the pipe. Post rehabilitation television inspection shall be performed prior to removing any sewer bypass equipment. Post rehabilitation television inspection shall be considered incidental to the lining process and shall not be measured separately for payment.

3.06 TESTING REQUIREMENTS:

- A. Cured-in-place pipe samples shall be prepared and tested by the Contractor in accordance with ASTM F1216 Section 8.1 unless otherwise stated in this section.
- B. The Contractor shall obtain samples for **each** pipe inversion.
- C. If field conditions or pipe shape prevent the Contractor from obtaining the samples as specified in ASTM F1216 Section 8.1 the samples shall be taken as required by the Engineer.
- D. An independent testing laboratory shall test the cured-in-place pipe samples and the results are to be sent directly to the Engineers Resident Project Representative within 21 calendar days following the completion of each inversion.
- E. The cost of obtaining the samples and testing shall be the sole responsibility of the Contractor and shall be considered incidental to the lining process.
- F. Inversions where the cured-in-place pipe samples that do not meet the requirements of ASTM D790 and D638 as indicated in ASTM F1216 Section 8 will be televised by the Contractor, as required by the Engineer, at no additional cost to the Owner, for review by the Engineer. Liner deemed unacceptable by the Engineer will be removed and replaced at no additional cost to the Owner.

3.07 FIELD TESTING/INSPECTION:

- A. Prior to expiration of the warranty period, during periods of high groundwater, and at a time to be approved by the Engineer, the Contractor shall clean and television inspect each of the cured-in-place pipes in accordance with Section 02440, SEWER CLEANING AND INSPECTION. The contractor shall repair any defects found in the cured-in-place pipe. The contractor shall reseal the annular space between the sewer main and the cured-in-place pipe at manhole locations and service connections until there are no visible leaks through television inspection.
- B. All inspecting and resealing or lining within the warranty period shall be provided at no additional cost to the Owner.

## SERVICE CONNECTION REINSTATEMENT CERTIFICATION FORM

The Contractor shall review sewer tie cards, television inspection tapes, and perform dye tests as necessary to determine which service connections should be reinstated following installation of a Cured-in-Place Liner. Details regarding the location of each service connection that will be reinstated, including Manhole-to-Manhole reach, stationing, and clock position shall be recorded on this form.

---

### Service Connections to be Reinstated (Clock Position)

Inversion # _____	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____

The Contractor shall be responsible for reinstatement of **all active** service connections following Cured-in-Place Lining. If active service connections are found, at any future date, not to have been reinstated, the Contractor shall reinstate them within three (3) calendar days of notification, at his sole expense.

Contractor

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Print Name

END OF SECTION

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## SECTION 02435

### SEWER MANHOLE REHABILITATION

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers the rehabilitation of sewer manholes as called for herein and on the drawings. It is the intent of this specification to provide for the waterproofing, sealing, and structural enhancement of existing manholes by chemical grout exterior sealing of sewer manhole inverts, walls and corbels; and by application of a uniform cementitious layer of high-quality mortar. Additional manhole rehabilitation related items include installing manhole inflow dishes, replacing manhole frames and covers, raising manhole frames and covers to grade, and building manhole benches and inverts.
- B. The work shall include: elimination of infiltration by external chemical grout sealing; removal and patching of loose and/or unsound material; cleaning and preparation of surfaces; repair of invert, bench, and walls; and chemical grout sealing of the invert, bench, walls, and pipe connections; and spray application of a cementitious mix to form a liner. Other repairs shall be completed as indicated on the drawings and described herein.
- C. The contractor shall furnish all equipment, material and labor required to perform all manhole rehabilitations described in this specification.
- D. External grouting of inverts, bench, walls, corbel, and pipe connections shall be performed prior to application of cementitious mix.
- E. Manhole inspection logs are included in Appendix A for reference.

##### 1.02 RELATED WORK:

- A. Section 00331, TELEVISION INSPECTION REPORTS AND MANHOLE INSPECTION REPORTS PROVIDED BY THE OWNER
- B. Section 01014, SCOPE AND SEQUENCE OF WORK
- C. Section 01330, SUBMITTALS
- D. Section 01331, DOCUMENTATION
- E. Section 01575, HANDLING EXISTING FLOWS

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO)

Performance Specification Guideline for Manhole Rehabilitation

American Society for Testing and Materials (ASTM)

ASTM C94	Ready-Mix Concrete
ASTM C109	Comprehensive Strength
ASTM C267	Chemical Resistance
ASTM C596	Shrinkage
ASTM C666, Method A	Freeze/Thaw Resistance
ASTM D4414	Standard Practice for Measurement of Wet Film Thickness for Organic Coatings
ASTM 543	Resistance of Plastics to Chemical Reagents
ASTM 638	Tensile Properties of Plastic
ASTM 695	Comprehensive Properties of Rigid Plastics
ASTM D790	Flexural Properties of Unreinforced and Reinforced Plastics

1.05 CEMENTITIOUS LINING SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, sewer manhole sealing shall be carried out in accordance with the current edition of the Performance Specification Guideline for Manhole Rehabilitation (NASSCO).
- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.
- C. The locations of the cementitious lining work to be completed are as shown on the drawings.



1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit six (6) sets of the following:
  - 1. Qualifications of the firm/personnel who will perform the work.
  - 2. Provide at least five (5) references of different projects in which at least 50 manholes have been rehabilitated by the firm within the past three (3) years.
  - 3. Description of the system, equipment and material with MSDS Data Sheets proposed for sewer manhole rehabilitation.
  - 4. Description of the system proposed for bypass pumping during the procedures to be carried out.
  - 5. Manufacturer's warranty
- B. Refer to Section 01331, DOCUMENTATION, for required documentation to be submitted.

1.07 WARRANTY:

- A. The manhole rehabilitation work performed shall be warrantied against infiltration and faulty workmanship and materials for a period of one (1) year after the project is accepted by the Owner.

PART 2 - PRODUCTS

2.01 REHABILITATION MATERIALS:

All products used for lining, sealing, patching, and cleaning shall be environmentally safe. The contractor shall submit MSDS Data Sheets for all materials used.

2.02 SEALING OF INVERT, STOPPING ACTIVE LEAKS AND EXTERIOR CHEMICAL SEALING:

The contractor shall use a chemical grout that is environmentally safe for the sealing of sewers. The chemical grout shall be in accordance with Part 2, Products, of the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts).

### 2.03 PATCHING MIX:

A quick-setting cementitious material shall be used as a patching mix and is to be mixed and applied according to the manufacturer's recommendation and shall have the following minimum requirements.

Compressive Strength	ASTM C-109	6 hr 1,400 psi
Shrinkage	ASTM C-596	0% AT 90% Relative Humidity

### 2.04 INFILTRATION CONTROL MIX:

A rapid-setting cementitious product specifically for leak control shall be used to stop water infiltration and shall be mixed and applied according to the manufacturer's recommendations and shall have the following minimum requirements.

Compressive Strength	ASTM C-109	1 hr 600 psi
Compressive Strength	ASTM C-109	24 hr 1,800 psi

### 2.05 LINER MIX:

- A. The cementitious liner mix shall be used to form a structural enhancing monolithic liner covering all interior manhole surfaces and shall have the following minimum requirements at 28 days:

Compressive Strength	ASTM C-109	6,000 psi
Shrinkage	ASTM C-596	0%, 90% humidity
Freeze/Thaw Resistance	ASTM C-666	No visible damage after 100 cycles

- B. The liner mix shall be applied in one monolithic layer.

### 2.06 BRICK MATERIALS:

- A. Brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Bricks shall comply with ASTM C32, for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.
- B. Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.
- C. Mortar shall be composed of Portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SS Brick

shall be mixed in the volume proportions of 1:1/2:4-1/2; Portland cement to hydrated lime to sand.

- D. Cement shall be Type II Portland cement as specified for concrete masonry.
- E. Hydrated lime shall be Type S conforming to ASTM C207.
- F. Sand shall comply with ASTM C144 specifications for "Fine Aggregate," except that all of the sand shall pass a No. 8 sieve.

2.07 CONCRETE:

- A. Cement shall be domestic Portland cement conforming to ASTM C150, Type II.
- B. Fine aggregate shall be washed natural sand conforming to ASTM C33.
- C. Coarse aggregate shall be well graded crushed stone conforming to ASTM C33, size No. 67.
- D. No admixtures shall be used unless approved by the Engineer in writing.

2.08 WATER:

Water used in mixing shall be potable.

2.09 DELIVERY, STORAGE, AND HANDLING:

- A. Materials shall be delivered to the site in the Manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. All materials shall be stored properly and in accordance with Manufacturer's instructions.

PART 3 - EXECUTION

3.01 SAMPLING AND TESTING OF LINER:

- A. The Owner reserves the right to test all materials.
- B. Products that fail to meet the requirements of these specifications shall not be incorporated in the work.

### 3.02 SURFACE PROTECTION:

- A. During progress of work, where appearance is important, adjacent areas or grounds which may be permanently discolored, stained, or otherwise damaged by dust and rebound, shall be adequately protected and, if contacted, shall be cleaned by early scraping, brushing or washing, as the surroundings permit.
- B. No street markings shall be removed or covered throughout the progress of work.

### 3.03 EXISTING FLOWS:

The Contractor shall divert flows as required for the work and in accordance with the requirements specified in Section 01575, HANDLING EXISTING FLOWS.

### 3.04 CEMENTITIOUS LINING:

#### A. Preparation

- 1. Remove all foreign material from the manhole wall and bench using a high-pressure water spray (minimum 5,000 psi). Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper. Fill any large voids with quick-setting patching mix. Surfaces to be repaired shall be clean and free of loose materials. Additional surface preparation shall be as recommended by the manufacturer of the materials to be applied.
- 2. Leaks shall be stopped using a chemical grout, which shall be applied as per the manufacturer's recommendations. Leaks may require weep holes drilled at the manhole base to localize the infiltration during the application, after which the weep holes shall be sealed with a chemical grout and plugged with the quick-setting infiltration control mix prior to the final liner application. Areas with evidence of previous leakage (e.g., mineral deposits) shall also be grouted.

#### B. Invert Sealing

- 1. The Contractor shall carry out all work as described in the Performance Specification Guideline for Manhole Rehabilitation, Section 3.2C (NASSCO) using sealing materials and procedures accepted by the Engineer.
- 2. Grout ports shall be located and drilled in the bench and invert as necessary to seal the invert and manhole base. Grout ports shall also be located and drilled at the manhole/pipe connections.
- 3. A quick setting patch mix shall be troweled uniformly not to exceed 1/2-inch, onto the invert extended out onto the base of the manhole sufficiently to tie into the structurally enhanced monolithic liner to be applied.

C. Exterior Grouting

1. Grout ports shall be drilled at all leaks.
2. Grout ports shall be drilled at all manhole/pipe connections.
3. For brick/block manholes, grout ports shall be located and drilled at 90-degree intervals and every two (2) vertical feet (maximum) around the circumference every two (2) feet (maximum) of the manhole to ensure proper grouting of the soil outside the manhole.
4. For precast manholes, grout ports shall be located so as to seal any other defects not occurring at a joint.
5. Chemical sealing material shall be pumped through the grout ports to seal the exterior of the manhole. Areas with evidence of previous leakage (e.g., mineral deposits) shall also be grouted.
6. The Contractor shall prohibit debris from entering the invert by either covering the invert or plugging during application.
7. The chemical sealing material used shall be as described in chemical sealing (grouting) materials of the Performance Specification for Manhole Rehabilitation (NASSCO).

D. Interior Sealing

1. Interior lining of the manholes shall be conducted only after all other manhole rehabilitations have been completed.
2. Unless otherwise indicated herein, the Contractor shall carry out all work as described in the Performance Specification Guideline for Manhole Rehabilitation, Section 3.2 (NASSCO) using lining materials and procedures accepted by the Engineer.
3. Preparation, as described in section 3.05A, shall be completed prior to the placement of the cementitious liner.
4. Sealant shall not be placed on a frozen surface or during freezing weather. Sealant shall not be placed when it is anticipated that the temperature during the following 24 hours will drop below 32 degrees, Fahrenheit.
5. Pipes and/or service connections shall be temporarily plugged prior to the application of the cementitious manhole interior liner. A flash coat of the liner

material shall be applied three (3) inches into each service connection. Temporary plugs shall be removed once the liner has cured sufficiently to prevent erosion of the new liner.

6. Thickness shall be verified with a wet gauge at random points of the new interior surfaces as required by the Engineer. Minimum thickness of one-half (½) inch is required.
7. Application shall be with low velocity, continuous flow equipment to prevent the adverse effects of rebound. A smooth trowel finish shall be applied.
8. The Contractor shall prohibit debris from entering the invert by either covering the invert or plugging during application.

E. Digital Photographs

1. The Contractor shall take a digital photograph of the interior of each manhole, before and after rehabilitation, in JPEG format. Filenames shall contain subarea and manhole designations (e.g. "G-05A-001"). Digital photographs shall have a minimum resolution of four (4) megapixels.

3.05 MANHOLE GROUTING AND PATCHING TO STOP LEAKS:

- A. The Contractor shall drill grout ports at all leaks. Chemical sealing material shall be pumped through the grout ports to seal the exterior of the manhole. Areas with evidence of previous leakage (e.g., mineral deposits) shall also be grouted. Grout ports shall be plugged with the quick-setting infiltration control mix following completing of grout installation.
- B. Grout ports shall be located and drilled at all manhole/pipe connections.
- C. The Contractor shall prohibit debris from entering the invert by either covering the invert or plugging during rehabilitation.
- D. The chemical sealing material used shall be as described in chemical sealing (grouting) materials of the NASSCO Standards Specification.
- E. The Contractor shall take a digital photograph of the interior of each manhole, before and after rehabilitation, in JPEG format. Filenames shall contain subarea and manhole designations (e.g. "49011"). Digital photographs shall have a minimum resolution of four (4) megapixels.

**3.06 FURNISH AND INSTALL MANHOLE INFLOW DISH:**

Furnish and install Southwestern Packing & Seals High Density Ethylene Hexene-1 Copolymer "Rainstopper" or approved equal at manholes as indicated on the plans.

**3.07 REPLACE MANHOLE FRAME AND COVER:**

- A. Contractor shall excavate, remove, and dispose of existing frames and covers. The Contractor shall furnish and install new frames and covers at these locations. Manhole frames with 26-inch covers for 24-inch openings shall be 475 pounds minimum by EJ, No. 2110A/Z; Neenah Foundry Co. R1720; Quality Products Water Products, Style 40; or approved equal.
- B. Frames shall be set concentric with the top of the manhole and in a full bed of mortar so that the space between the top of the concrete section or brick headers and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to be flush with the top of the flange and have a slight slope to shed water away from the frame.

**3.08 RAISE MANHOLE FRAME AND COVER TO GRADE:**

Manhole frame and cover shall be removed and courses of brick added to raise the manhole frame and cover to existing grade. Frames shall be set concentric with the top of the manhole and in a full bed of mortar so that the space between the top of the concrete section or brick headers and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to be flush with the top of the flange and have a slight slope to shed water away from the frame.

**3.09 BUILD MANHOLE BENCH AND INVERT:**

- A. Existing manhole bench and invert (including debris, deteriorated brick, block, and mortar) shall be removed and disposed of.
- B. Bricks shall be moistened by suitable means, as required, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
- C. Each brick shall be laid as a header in a full bed and joint of mortar without requiring subsequent grouting, flushing or filling, and shall be thoroughly bonded as required.
- D. Channels and shelves shall be constructed of brick and concrete as shown on the Drawings. The brick lined channels shall correspond in shape with the lower half of the pipe. The top of the shelf shall be set at the elevation of the crown of the highest pipe and shall be sloped 1 inch per foot to drain toward the flow through channel. Brick

surfaces exposed to sewage flow shall be constructed with a nominal 2-inch by 8-inch face exposed (i.e. bricks on edge).

3.10 FIELD TESTING/INSPECTION:

- A. Prior to the expiration of the warranty period, the Contractor shall inspect **each (100%)** of the sewer manholes rehabilitated during this project in accordance with the Performance Specification Guideline for Manhole Rehabilitation (NASSCO) at a timetable to be approved by the Engineer. The Contractor shall repair any defects found until there are no visible leaks.
- B. If the initial failure rate of tested manholes is less than 10%, the work will be considered satisfactory and no further testing will be required.
- C. If the defect rate is greater than 10% and less than 20% the Contractor will be required reinspect the defective manholes the following year. The Contractor shall repair any defects found until there are no visible leaks.
- D. If the defect rate is greater than 20% the Contractor will be required to reinspect **each (100%)** of the sewer manholes rehabilitated during this project the following year. The Contractor shall repair any defects found until there are no visible leaks.
- E. All inspecting, testing, and reworking within the warranty period shall be provided at no additional cost to the Owner.

END OF SECTION

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## SECTION 02437

### SEWER LINE CHEMICAL ROOT TREATMENT

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers chemical root treatment of sewer lines as called for herein and on the drawings. The work includes furnishing all equipment, material, and labor required to perform the services described herein.

##### 1.02 RELATED WORK:

- A. Section 00331, TV INSPECTION AND MH INSPECTION REPORTS PROVIDED BY THE OWNER
- B. Section 00890, PERMITS
- C. Section 01014, SCOPE AND SEQUENCE OF WORK
- D. Section 01330, SUBMITTALS
- E. Section 01331, DOCUMENTATION
- F. Section 01575, HANDLING EXISTING FLOWS
- G. Section 02440, SEWER CLEANING AND INSPECTION

##### 1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

##### 1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO)

Sewer Line Chemical Root Control – Technical Specifications (Duke's Root Control)  
Foaming Root Control Herbicide – Technical Specifications (Vaporooter)

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, chemical root treatment of the specified lengths of pipe shall be carried out in accordance with Foaming Root Control Herbicide – Technical Specifications (Vaporooter) of the NASSCO Specification Guidelines.
- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit six (6) sets of the following:
  - 1. Qualifications of the firm/personnel who will perform the work.
  - 2. Description of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
  - 3. Description of the system, equipment, and material proposed for root treatment and cleaning of the pipes, including Material Safety Data Sheets (MSDS) for all chemicals intended to be used.
  - 4. Manufacturer's warranty.
  - 5. Copy of MWRA Root Control Request Permit in accordance with Section 00890, PERMITS.
- B. Refer to Section 01331, DOCUMENTATION for required documentation to be submitted.

1.07 WARRANTY:

- A. The Contractor shall provide a written guarantee that meets or exceeds any claims or warranties made by the manufacturer in published advertising. As a minimum, the Contractor shall guarantee that, prior to scheduled cleaning, virtually all root tissue present in the sewer pipe will be dead or unable to sustain life.

PART 2 - PRODUCTS

2.01 ROOT TREATMENT MATERIALS:

- A. The chemical root treatment material shall be EPA registered and labeled for use in sewer lines and acceptable to the state agencies having jurisdiction over its use. The Contractor shall submit a specimen product label of the material to be used in chemical root treatment to the Engineer. The chemical root treatment material shall not permanently affect parts of trees distant from the treated roots.

- B. Materials shall meet the requirements of the Foaming Root Control Herbicide – Technical Specifications (Vaporooter) of the NASSCO Specification Guidelines.

### PART 3 - EXECUTION

#### 3.01 ROOT TREATMENT:

- A. The Contractor shall carry out all preparatory work, including flow control, and apply root treatment as described in the Foaming Root Control Herbicide – Technical Specifications (Vaporooter) of the NASSCO Specification Guidelines, using treatment materials accepted by the Engineer.

#### 3.02 ROOT CLEANING:

- A. Root cleaning shall be carried out under Section 02440, SEWER CLEANING AND INSPECTION.

END OF SECTION

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## SECTION 02440

### SEWER CLEANING AND INSPECTION

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This section covers cleaning and inspection of pipelines as called for herein and on the drawings. The work includes furnishing all equipment, material, and labor required to perform the services described herein. The sewer lines were previously cleaned and televised. The television inspection logs are included as Appendix A for reference.

##### 1.02 RELATED WORK:

- A. Section 00331, TV INSPECTION AND MH INSPECTION REPORTS PROVIDED BY OWNER
- B. Section 01014, SCOPE AND SEQUENCE OF WORK
- C. Section 01330, SUBMITTALS
- D. Section 01331, DOCUMENTATION
- E. Section 01575, HANDLING EXISTING FLOWS
- F. Section 02428, CURED-IN-PLACE PIPE
- G. Section 02437, SEWER LINE CHEMICAL ROOT TREATMENT
- H. Section 02443, SERVICE CONNECTION REHABILITATION

##### 1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO)

Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts)

American Society of Testing and Materials (ASTM)

ASTM F2304 Standard Practice for Rehabilitation of Sewers Using Chemical Grouting

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, the pipe cleaning and inspection of the specified length of pipe shall be carried out in accordance with Section 3, Execution, of the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts). Sewer flow control shall comply with Section 01575, HANDLING OF EXISTING FLOWS.
- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Prior to beginning work, submit six (6) sets of the following:
1. Qualifications of the firm/personnel who will perform the work.
  2. Description of system proposed for handling existing flows during the various procedures to be carried out.
  3. Description of the system and equipment proposed for cleaning the pipe.
  4. Description of the equipment and system proposed for inspecting the pipe after cleaning.
- B. Refer to Section 01331, DOCUMENTATION for required documentation to be submitted.

## PART 2 - PRODUCTS

### 2.01 CLEANING MATERIALS:

- A. All other products used for cleaning of sewers shall also be environmentally safe.

## PART 3 - EXECUTION

### 3.01 PIPE CLEANING:

- A. Chemical root treatment, where required, shall be applied under Section 02437, SEWER LINE CHEMICAL ROOT TREATMENT before the cleaning operation is carried out. Sufficient time shall be allowed between the two operations as described in SEWER LINE CHEMICAL ROOT TREATMENT (FOAMING METHOD) of the NASSCO Standard Specifications.
- B. The Contractor may elect to use either high velocity jet, or mechanically powered equipment, as described in the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts). Selection of equipment shall be based upon field conditions such as access to manholes, quantity of debris, size of sewer, depth of flow, etc.
- C. All sludge, dirt, sand, rocks, grease, and other solid or semisolid material resulting from the cleaning operation shall be disposed of in accordance with all applicable regulations and in a method acceptable to the Owner. Pipe cleaning shall be performed in advance of pipe television inspection.
- D. The Contractor shall be responsible for the legal disposal of all debris removed from the sewers during the cleaning operation including any costs incurred. The Contractor shall not expect the Owner to provide a dump site.
- E. Acceptance by the Engineer of the cleaning results will be based on the results of television inspection. If the results are unsatisfactory, the Contractor shall repeat the cleaning until accepted by the Engineer at no additional cost to the Owner.

### 3.02 PIPE INSPECTION:

- A. Pipe shall be visually inspected by means of closed-circuit television. The television camera used for the inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture, with minimal reflective glare, for the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor and other components of the video system shall be capable of producing a minimum 400 line resolution color video picture. Picture quality and definition shall be to the satisfaction of the Engineer.

1. Refer to Section 01331, DOCUMENTATION, in regard to DVD's/external hard drives to be given to the Owner upon completion of project and before the project is accepted by the Owner.
- B. The camera shall have a remote controlled, pan and tilt type lens and lighting system capable of turning perpendicular to the direction of flow and rotating 360 degrees while inside the pipe. The camera shall be able to view a minimum service connection length of four (4) feet in order to determine whether the connection is active or inactive.
- C. Electronic video equipment shall be capable of displaying and recording during the entire inspection, as a minimum, the following data for each sewer reach videotaped:
  1. Project identification
  2. Date recorded
  3. Sewer reach identification (street location, MH to MH)
  4. Footage counter
- D. The camera shall be moved through the line in either direction at a uniform rate, stopping when necessary to ensure proper identification of the sewer's condition. Manual winches, power winches, television cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation the television camera will not pass through the entire sewer section, the Contractor shall re-set his equipment in a manner so that the inspection can be performed from the opposite manhole.
- E. Flow control shall be in accordance with Section 01575, HANDLING OF EXISTING FLOWS.
- F. Standing water within a sagging pipe shall be removed so that the pipe can be adequately television inspected. A minimum of 80% of the pipe shall be visible before television inspection.
- G. Removal of obstruction caused by protruding taps shall be in accordance with Section 02443, SERVICE CONNECTION REHABILITATION.
- H. Television inspection shall be performed in advance of pipe repair and pipe lining activities.

#### END OF SECTION

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## SECTION 02442

### POINT REPAIR OF GRAVITY SEWERS (OPEN-CUT)

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers the point repair of gravity sewers using open cut construction methods. The Work includes furnishing all equipment, material, and labor required to point repair a sewer pipe section as described herein.
- B. A point repair shall be identified as a repair made at a specified location on a sanitary sewer line. The point repairs are identified on the drawings; see the television inspection logs for additional information.

##### 1.02 RELATED WORK:

- A. Section 01575, HANDLING EXISTING FLOWS
- B. Section 01740, CLEANING UP
- C. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS
- D. Section 02252, SUPPORT OF EXCAVATION
- E. Section 02300, EARTHWORK
- F. Section 02530, BUILDING CONNECTIONS
- G. Section 02745, PAVING
- H. Section 02920, LOAMING AND SEEDING

##### 1.03 QUALITY ASSURANCE:

The Work described herein shall be performed by a company with not less than two (2) years of experience in providing the required services, employing experienced supervisory personnel.

##### 1.04 REFERENCES:

The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO) Specifications  
Guidelines for Sewer Collection System Maintenance & Rehabilitation.



1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Prior to beginning the Work, submit six (6) sets of the following:

1. Qualifications of the firm/personnel who will perform the Work.
2. Description of system proposed for handling existing flows, if necessary.
3. Description of the system, equipment and material proposed, including the source and name of manufacturer.
4. Specifications and Data Sheets of all materials to be used, including a list of applicable ASTM standards.
5. Material and structural details of the point repair method proposed, including typical cross-sections and strength calculations.
6. Prior to beginning the work, the Contractor shall submit a written plan for contacting homeowners whose service connections may be affected due to the work. Such plan is subject to approval by the Engineer.

PART 2 - PRODUCTS

2.01 GENERAL:

All workmanship and materials used for making point repairs shall be of the highest quality. The materials shall be the products of a manufacturer actively engaged in research, development, and manufacturing of said materials.

2.02 REPAIR PIPE:

The repair pipe shall be POLYVINYL CHLORIDE (PVC) GRAVITY PIPE as specified in Section 02085. The inside diameter of the replacement pipe size shall be the same as the existing pipe.

2.03 JOINT MATERIALS:

When connecting together joints of plain-end spigot pipe, suitable adaptors shall be used for joining dissimilar pipe materials. The adapters shall be Fernco Couplings, or approved equal. All materials shall pass the strength and chemical requirements of current ASTM requirements. Adapters and methods of connecting pipes shall be approved by the Engineer. The Contractor shall submit to the Engineer descriptive literature and materials on the adaptors and connection method he proposes to use.

2.04 BUILDING CONNECTIONS:

Any building connection replaced during a point repair shall conform to pipe manufacturer's recommendations and specifications and applicable ASTM

specifications, for furnishing and installing the building connection. The connection materials shall be similar to the connecting sewer pipe.

#### 2.05 SEALING OPEN JOINTS:

Any open joint to be sealed during a point repair shall be yarned, wiped, and encased with concrete. The encasement shall be centered on the joint, have a minimum thickness of six (6) inches of concrete, and have a minimum length equal to the pipe diameter, but not less than twelve (12) inches. Any alternative method for sealing open joints shall be submitted to the Engineer for approval.

### PART 3 - EXECUTION

#### 3.01 SAFETY:

The Contractor shall perform all work in strict accordance with all applicable OSHA standards. Particular attention is drawn to those safety requirements regarding confined space entry.

#### 3.02 POINT REPAIR METHOD:

The method by which the point repair shall be made shall include all supervision, labor, equipment, and materials necessary to perform and successfully complete the following items of work:

1. Excavate a trench deep enough to uncover the gravity sewer line and wide enough and long enough to work in, in accordance with the latest OSHA requirements.
2. Remove any existing fences, base material, storm sewers, water mains, and other items that interfere with the repair made at each specific point, and replace the fences, base material, storm sewers, water mains, and other removed items in the same or better condition than found, as determined by the Engineer.
3. Replace and reshape the bottom of the trench so that the grade of the pipe replaced will match that required for the existing sewer line. Any material replaced in the bottom of the trench shall be tamped so as to prevent sags in the sewer line due to settlement of trench material. If the material in the bottom of the trench is not stable, the Contractor shall stabilize the trench bottom by placing suitable materials at the request of the Engineer.
4. Repair and replace the section of damaged sewer identified on the Drawings and in Appendix A herein. The damaged section of pipe shall be removed and a replacement section of PVC pipe shall be spliced in its place, using Fernco couplings at each end of the splice.
5. Repair and replace any service wye or tee encountered within the required point repair, or any service wye or tee connection, or service line judged to be a source of infiltration/inflow by the Engineer. All service lines broken by the Contractor shall be replaced by the Contractor at his expense. Replacement of a wye or tee

shall include one (1) linear foot of mainline on either side of the new connection, at no additional cost to the owner.

6. Seal open joints exposed within the pipe excavation, where the barrel of the pipe is still satisfactory but the joints are not. Any roots in open joints shall be removed before sealing. Determination as to whether or not roots exist shall be made by the Engineer. The materials to use when sealing open joints are listed in subsection 2.05.
7. Connect all newly laid sewer pipe to existing pipe, and main sewer lines to services, so that no possible source of infiltration/inflow (a leak in the line) may be created. When applicable, the main sewer line shall be cut so that a smooth plain-end spigot exists at both ends of the trench and connected, as specified in subsection 2.03. The materials used to make the tie-ins shall be properly sized as specified in section 2.02. Any sewer pipe broken by the Contractor shall be replaced at the Contractors expense. All such occurrences shall be pointed out to the Engineer.
8. Backfill the excavation, and replace the trench pavement as specified in Section 02745, PAVING, so that the finished elevation will match the natural ground elevation and no ponding will occur after the backfilled material has settled.
9. Clean up the area as specified in Section 01740, CLEANING UP.

### 3.03 ABANDONMENT:

- A. If a decision is made by the Engineer in the field that a point repair will not satisfactorily correct the problem, or if the Contractor excavates at the required location and does not find the source of the problem, the Engineer shall verify the condition, declare the point repair to be abandoned and the excavation shall be backfilled.
- B. At such time as the point repair has been declared abandoned, the Engineer shall determine how to proceed or whether to reclassify the sewer line for further investigation.

### 3.04 FIELD JUDGEMENTS:

At any time during a point repair, the Engineer shall make field judgements by interpreting the project design intent in accordance with the bid documents. Field judgements shall include the following situations and any other questionable situation that may arise:

1. Determination of the length of sewer pipe to repair.
2. Determination of method of payment for additional work outside the original point repair area.
3. Determination of dewatering requirements.
4. Determination of abandonment.

5. By-pass pumping of sewage.
6. Determination of the amount of asphalt, concrete driveway, curb or sidewalk, or any other surface feature to be replaced.

3.05 BY-PASS PUMPING:

On all point repairs, the normal flow of sewage shall be re-routed by by-pass pumping so as not to interrupt the flow of sewage to the treatment plant. By-pass pumping shall be as specified in Section 01575, HANDLING OF EXISTING FLOWS.

3.06 RESTORATION:

- A. The Contractor shall replace all streets, roadways, sidewalks, and driveways which may be removed, disturbed, or damaged in connection with his operation under this Contract. The Contractor shall reconstruct same to the original lines and grades and in such a manner as to leave all such surfaces in fully as good or better condition than that which existed prior to his operations. The re-use of materials removed in making excavations will be permitted in the manner described, provided said materials are in good condition and are acceptable to the Engineer.
- B. In easements and other unpaved areas, the Contractor shall return the area as close as is practicable to its original condition to the satisfaction of the Engineer, at no additional cost to the Owner.

3.07 INSPECTION

- A. Prior to the end of the warranty period, the section of pipe where the point repair is located shall be television inspected for defects in accordance with Section 02440, SEWER CLEANING AND INSPECTION.

END OF SECTION

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## SECTION 02443

### SERVICE CONNECTION REHABILITATION

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers the rehabilitation of service connections, including cutting of protruding services, television inspection and testing of services, and grouting of services as called for herein and on the drawings. The work includes furnishing all equipment, material, and labor required to perform the services described herein.

##### 1.02 RELATED WORK:

- A. Section 00331, TV INSPECTION AND MH INSPECTION REPORTS PROVIDED BY THE OWNER
- B. Section 01014, SCOPE AND SEQUENCE OF WORK
- C. Section 01330, SUBMITTALS
- D. Section 01331, DOCUMENTATION
- E. Section 01575, HANDLING EXISTING FLOWS
- F. Section 02428, CURED-IN-PLACE PIPE
- G. Section 02440, SEWER CLEANING AND INSPECTION

##### 1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workmen and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

##### 1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO)

Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts)

American Society of Testing and Materials (ASTM)

ASTM F2454 Standard Practice for Sealing Lateral Connections and Lines from the Mainline Sewer Systems by the Lateral Packer Method, Using Chemical Grouting

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, service connection rehabilitation shall be carried out in accordance with Lateral Connection Sealing from the Mainline by Packer Injection Grouting, Section 3.10, of the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts).
- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.
- C. The location of the service connection rehabilitations are indicated on the drawings.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit six (6) sets of the following:
  - 1. Qualifications of the firm/personnel who will perform the work.
  - 2. Descriptions of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
  - 3. Description of the system, equipment and material proposed for the service connection rehabilitations.
  - 4. Manufacturer's warranty.
  - 5. Submit Material Safety Data Sheets (MSDS) for proposed chemicals to be used.
- B. Refer to Section 01331, DOCUMENTATION, for documentation required to be submitted.

1.07 WARRANTY:

- A. The service connection rehabilitations shall be warrantied against infiltration and faulty workmanship and materials for one (1) year from the date the project is accepted by the Owner.

## PART 2 - PRODUCTS

### 2.01 CHEMICAL GROUT:

- A. The Contractor shall use chemical grout which is environmentally safe for the sealing of sewers. The chemical sealing materials shall be used in accordance with Part 2, Products, of the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts). All other products used for sealing, patching, and cleaning of sewers shall also be environmentally safe.
- B. The chemical grout material shall be EPA registered and labeled for use in sewer lines and acceptable to the state agencies having jurisdiction over its use.

## PART 3 - EXECUTION

### 3.01 PIPE CLEANING AND INSPECTION:

- A. Pipe cleaning and inspection shall be carried out in accordance with Section 02440, SEWER CLEANING AND INSPECTION.

### 3.02 FLOW CONTROL:

- A. Flow control, if required, shall be in accordance with Section 01575, HANDLING EXISTING FLOWS.

### 3.03 CUTTING OF PROTRUDING SERVICE CONNECTIONS:

- A. The Contractor shall cut protruding service connections where called for on the drawings. The protruding services shall be cut flush with the wall of the sewer, using either a lateral cutter or grinder.

### 3.04 EQUIPMENT TESTING:

- A. The Contractor shall perform an above ground demonstration test in a test cylinder with the same diameter as the proposed pipe being tested to simulate a pipe leak. The setup shall have a valve and pressure gauge to simulate leaks and monitor pressure. The tests shall be performed in accordance with ASTM F2454, Standard Practice for Sealing Lateral Connections and Lines from the Mainline Sewer Systems by the Lateral Packer Method, Using Chemical Grouting, Section 11.3.3, Initial Testing.
- B. The pressure displayed by the testing equipment shall be within  $\pm 0.5$  psi of the gauge pressure to pass successfully. The void pressure should drop to within  $\pm 0.5$  psi of the pre-test pressure displayed by the testing equipment after the pressure is released to pass successfully. Test pressures shall be between seven (7) and 10 psi.

- C. If the demonstration test cannot be performed successfully, the Contractor shall repair or modify the equipment and perform the test again until the results are satisfactory to the Engineer.
- D. The Contractor shall perform the demonstration test for each chemical sealing unit prior to the equipment being used on the Project. Additional tests may be required by the Engineer at various times during the Project.

3.05 TELEVISION INSPECTION AND TESTING OF SERVICE CONNECTIONS:

- A. The Contractor shall television inspect and test service connections where called for on the drawings. Television inspection of services shall utilize a pan and tilt camera which shall inspect a minimum of four (4) feet of the service connection from the main sewer.
- B. Pressure Testing: Air testing is accomplished by isolating the area to be tested with the packer and applying positive pressure into the isolated VOID area. VOID area shall include a minimum five (5) feet of service connection pipe. A chimney shorter than three (3) vertical feet shall be tested at the mainline connection. The contractor shall make all efforts to test the mainline connection, regardless of configuration.
- C. Pressure testing shall be carried out in accordance with Section 3.7, Lateral Connection Testing Procedure, of the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts).
- D. The allowable pressure drop shall be 0.5 pounds in 15 seconds at a pressure greater the ½ pounds per vertical foot of pipe cover or six (6) pounds minimum.
- E. The television inspection and testing equipment shall be capable of inspecting and testing 4-inch, 5-inch and 6-inch diameter service connections.
- F. If the service fails the pressure test, the service shall be grouted in accordance with paragraph 3.06 of this Section. If the service passes the pressure test, grouting is not required.

3.06 GROUTING OF SERVICE CONNECTIONS:

- A. The Contractor shall grout service connections where indicated on the drawings or when a service fails the pressure test, as described in paragraph 3.05 of this Section. The Contractor shall grout all service connections reinstated as described in Section 02428, CURED-IN-PLACE PIPE, regardless of the results of the pressure test. Grouting of service connections shall be carried out in accordance with Section 3.10, Lateral Connection Sealing from the Mainline by Packer Injection Grouting, of the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts).



- B. The grouting equipment shall be capable of grouting 4-inch, 5-inch and 6-inch diameter service connections.
- C. The chemical sealing materials shall be as described in Part 2, Products of the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts).
- D. If a service connection becomes clogged with grout, the Contractor shall clear the grout from the lateral. This work, as well as any work related to the blockage, shall be done at no additional cost to the Owner.

3.07 FIELD TESTING/INSPECTION:

- A. Prior to the expiration of the warranty period, an initial test sample of approximately 25% of the original service connection rehabilitation work will be selected and approved by the Engineer. The test sample will consist of manhole sections from throughout the project area that are representative of the sealing work originally performed. The Contractor shall television inspect and test all previously grouted service connections within the initial test sample as specified in paragraph 3.05 of this Section. Any service connections failing the retest shall be regouted as specified in paragraph 3.06 of this Section.
- B. If the failure rate in the initial test sample is less than 5%, the work will be considered satisfactory and no further testing will be required.
- C. If the failure rate in the initial test sample equals or exceeds 5%, an additional and equivalent test sample will be selected and approved by the Engineer. Additional test samples will be tested and resealed as necessary until the failure rate of less than 5% is met. No previously tested service connections can be included in a subsequent warranty test sample.
- D. Should all of the original service connection rehabilitation work fail to meet the less than 5% failure rate in each of the 25% test samples, the Contractor will be required to repeat the inspection procedure.
- E. Any remaining service connection rehabilitation work not television inspected and tested as part of a test sample shall be television inspected. The Contractor shall repair any defects found and shall regROUT the services until there are no visible leaks through television inspection.
- F. Television inspecting, testing, and regROUTING of service connections shall be performed prior to the expiration of the warranty period, during periods of high groundwater and at a time to be approved by the Engineer.

- G. All inspecting, retesting, and regrouting within the warranty period shall be provided at no additional cost to the Owner.

#### END OF SECTION

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SECTION 02530  
BUILDING CONNECTIONS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers furnishing of all materials and labor to construct building sewer connections as indicated on the Drawings, and as herein specified.
- B. Final location of building connections shall be determined in the field by the Engineer.

1.02 RELATED WORK:

- A. Section 01331, DOCUMENTATION
- B. Section 01575, HANDLING EXISTING FLOWS
- C. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS
- D. Section 02300, EARTHWORK
- E. Section 02324, ROCK EXCAVATION AND DISPOSAL
- F. Section 02440, SEWER CLEANING AND INSPECTION
- G. Section 02442, REPAIR OF GRAVITY SEWERS (OPEN CUT)
- H. Section 02531, SEWER CHIMNEYS
- I. Section 02533, CONNECTIONS TO EXISTING STRUCTURES
- J. Section 02631, PRECAST MANHOLES
- K. Section 03302, FIELD CONCRETE

1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six (6) sets of shop drawings and manufacturers literature of the materials of this section shall be submitted to the Engineer for review.
- B. Shop drawings of any special connections, including the proposed adapters for service connections, shall be submitted to the Engineer.

## PART 2 - PRODUCTS

### 2.01 MATERIALS:

- A. Pipe and fittings for drop connections and for gravity building connections shall be as specified under Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS. Adaptors shall be as recommended by the pipe manufacturer.

## PART 3 - EXECUTION

### 3.01 INSTALLATION:

#### A. Existing Active Building Connection Replacement

1. The Contractor shall affix a written notice to the door of each home that has sewer service to be disconnected and reinstated 48-hours prior to disconnection of the service and again the day of disconnection. A completion notice shall also be distributed following reconnection of the sewer service.
2. The written notice must include an approximation of the time that the service will be bypass pumped and the notice be approved by the Engineer prior to its distribution. The printing and distribution of notices to the homeowners by the Contractor shall be considered incidental to construction.
3. Flow from the existing sewer services shall be bypass pumped as specified in Section 01575, HANDLING EXISTING FLOWS.
4. Once the new mainline is available for connection, the existing service pipeline shall be removed at or near the property line and replaced as described below.
5. Building connections shall be installed using the same construction and pipe joining techniques as specified in Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS. Installation of a wye or tee shall include one (1) linear foot of mainline on either side of the new connection, at no additional cost to the owner.
6. In general, new connections shall be carried to the existing building connection at or near the property line. Final connection between the new and existing piping shall be made. If no existing service is present, the end of the new connection pipe shall be closed with PVC stoppers jointed in place to ensure against infiltration into the sewer line.
7. Where building connection changes line and grade, a cleanout shall be installed as required by the Engineer.
8. Prior to connecting to the new sewer service, the existing sewer service shall be televised (starting at the property line upstream to the building) using a color "push" camera. The condition of the service shall be documented in the same manner as a mainline sewer and in accordance with Section 02440, SEWER CLEANING AND

INSPECTION. Documentation shall be in accordance with Section 01331,  
DOCUMENTATION. Each video shall be labeled with the street address of  
inspected sewer service.

**END OF SECTION**

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## SECTION 02533

### CONNECTIONS TO EXISTING STRUCTURES

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

The Contractor shall furnish materials, tools, labor, and equipment to cut suitable openings into the existing sewer manholes, make connections to existing sewers, and all other work necessary to direct the existing sewage flow as indicated on the drawings and as herein specified.

##### 1.02 RELATED WORK:

Section 02631, PRECAST MANHOLES

##### 1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF THE GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Prior to start of work, submit details of the methods proposed for doing the work and for maintaining the sewage flow as herein specified.

#### PART 2 - PRODUCTS

Not applicable.

#### PART 3 - EXECUTION

##### 3.01 INSTALLATION:

- A. The Contractor shall provide temporary plugs or provide other suitable means for maintaining the new sewer free of sewage flow until such time as it can be inspected and tested for leakage.
- B. Connections to the new sewer shall be made when required by the Engineer and only after the new pipeline has been inspected and has successfully passed the leakage test.
- C. The Contractor shall modify each existing structure for installation of the necessary piping, but in so doing shall confine the cutting to the smallest amount possible consistent with the work to be done.
- D. All new piping connected to existing structures shall be encased in concrete in a manner satisfactory to the Engineer.

- E. All work shall be done with the proper tools and by careful workmen competent to do work.
- F. The Contractor shall cut, reshape and fill the existing manhole tables and plug existing outlets as indicated on the drawings and as required by the Engineer, to accommodate the new connections. Reshaped manhole invert channels shall be smoothly shaped to permit the flow of sewage. Manhole invert channels shall be reconstructed as specified under Section 02631, PRECAST MANHOLES.

END OF SECTION

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## SECTION 02624

### HIGH DENSITY POLYETHYLENE PIPE

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers furnishing, handling, laying, joining and installation of High Density Polyethylene (HDPE) piping, fittings and appurtenances.
- B. The Contractor shall furnish and install the various pipelines and appurtenant work as indicated on the Contract Drawings and as specified herein, or as reasonably required to produce a complete, proper, and functional installation in accordance with the intent of these Contract Documents.

##### 1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02631, PRECAST MANHOLES
- C. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE & FITTINGS

##### 1.03 REFERENCES:

- A. The following standards form a part of this specification as referenced:

#### American Water Works Association (AWWA)

AWWA	C906-90	Polyethylene PE Pressure Pipe and fittings, 4 in. through 63 in., for Water Distribution
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#### American Society for Testing and Materials (ASTM)

ASTM	D1248	Specifications for Polyethylene Plastics Molding and Extrusion Materials.
ASTM	D2837	Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
ASTM	D3350	Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
ASTM	F714	Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.



Plastic Pipe Institute (PPI)

PPI            TR-3 Policies and Procedures for Developing Hydrostatic Design Stresses  
for Thermoplastic Pipe Materials.

1.04    QUALITY ASSURANCE:

- A. All pipe and fittings shall be inspected and tested at the factory as required by the standard specifications to which the material is manufactured. The Contractor shall furnish in duplicate to the Engineer sworn certificates providing evidence of such tests.
- B. The Owner reserves the right to have any or all pipe, fittings, and special castings inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or tests shall be at the Owner's expense.
- C. Deflections in horizontal alignment will not be permitted at joints without written consent of the Engineer. If approved, deflections shall not exceed one-half the manufacturer's recommendation.
- D. When requested by the Engineer, the Contractor shall ensure that a qualified representative of the manufacturer shall be present at the jobsite for the first day of pipe laying, to assure that proper procedures are followed.
- E. The Engineer shall be notified in advance when the location of an existing pipeline conflicts with the proposed location of the Work.
- F. Pipe and fittings of the same type shall be products of a single manufacturer.
- G. All piping shall be of the type and size shown on the drawings and described in this section of the Specifications.

1.05    DELIVERY, STORAGE, AND HANDLING:

- A. Pipes and fittings shall be carefully handled when loading and unloading. Pipes shall be lifted by hoists or lowered on skidways in such a manner as to avoid shock.
- B. HDPE pipe shall be protected from exposure to sunlight (unless restrained in racks) to prevent bowing of the pipe due to expansion and contraction. Such protection shall consist of canvas covering, or other material, as recommended by the manufacturer. Plastic sheets, which may allow excessive temperatures to develop where the pipe is stored, shall not be used.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Shop drawings shall consist of manufacturer's scale drawings or catalog cuts including descriptive literature and complete characteristics, specifications, and code requirements. Shop drawings shall be submitted for the HDPE pressure pipe, type of joints, fittings, and couplings, in accordance with the specifications.

PART 2 - PRODUCTS

2.01 HIGH-DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS:

- A. All HDPE pipe and fittings shall be manufactured from virgin polyethylene resin, PE 3408, and shall conform to ASTM D3350.
- B. All polyethylene fittings shall have a pressure rating equal to or higher than the pressure rating of the pipe.
- C. All HDPE fittings at the manholes shall have ANSI Class 150 316 stainless steel backing rings.
- D. Unless noted otherwise, all pipe and fittings shall be SDR 17 rated at 80 psi.
- E. All piping and valves shall be supported by the size and style supports shown in the drawings, or an approved equal.
- F. Pipe shall be homogeneous throughout; free from voids, cracks, and other defects; as uniform as commercially practicable in color, density, and other physical properties.
- G. Pipe surfaces shall be free from nicks, scratches, and other blemishes. The joining surfaces of pipe shall be free from gouges and other imperfections that could cause leakage at joints.

PART 3 - EXECUTION

3.01 INSPECTION BEFORE INSTALLATION:

- A. Each length of pipe and each fitting shall be carefully inspected prior to being lowered into the trench. All materials not meeting the requirements of these specifications, or otherwise found defective or unsatisfactory by the Engineer, shall be rejected and immediately marked and removed from the jobsite by the Contractor.
- B. Bedding, sub-bedding, and other trench conditions shall be carefully inspected prior to laying pipe. All conditions shall be made available to the Engineer for inspection.

### 3.02 PIPE INSTALLATION:

- A. Pipe interiors, fitting interiors, and joint surfaces shall be thoroughly cleaned prior to installation. Pipes and fittings shall be maintained clean. For HDPE pipe, a clean cotton cloth shall be employed for cleaning; polyester-type materials shall not be used as they may melt during fusion procedures.
- B. Pipes shall be installed in the locations and to the required lines and grades shown on the drawings and provided in these Specifications, using an approved method of control.
- C. Excavations shall be maintained free of water during the progress of the Work. No pipes shall be laid in water, nor shall there be any joints made up in water.
- D. If any defective pipe is discovered after being placed, removal and replacement with sound pipe will be required at no additional cost to the Owner.

### 3.03 HDPE PIPE JOINING:

- A. HDPE pipe should be joined by butt-fusion methods, having a completely uniform and monolithic pipe interior according to the fusion joining procedures as instructed by the manufacturer.
- B. Each individual performing fusion joining shall have had at least one year of experience in the use of the fusion procedure.
- C. Inspection of joints shall be performed by a person qualified by training or experience to evaluate the acceptability of HDPE joints made under the applicable joining procedures.
- D. The pipe sections shall be joined at ground level to a length recommended by the manufacturer, such that when pulling the pipe into position alongside the trench, maximum allowable stress is not exceeded. Use appropriate materials and equipment, as recommended by the HDPE pipe manufacturer, when pulling butt-fused pipe sections alongside the trench, to prevent pipe damage.
- E. HDPE pipe boots shall be provided on all entrance piping in manholes.

3.04 TESTING:

- A. Prior to the pressure and leakage tests, the piping shall be thoroughly flushed clean of all dirt, dust, oil, grease and other foreign material. This work shall be done with care to avoid damage to linings and coatings.
- B. The installed pipe shall be pressure tested in accordance with AWWA Standard C600.
- C. PRESSURE TESTS:
  - 1. All pressure testing shall be performed as described in Section 02225 – PIPE BURSTING, 3.06 Leakage Testing.

END OF SECTION

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SECTION 02631  
PRECAST MANHOLES

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers all precast manholes complete, including, but not limited to, bases, walls, cones, mortar, inverts, frames and covers.

1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02745, PAVING
- C. Section 03302, FIELD CONCRETE

1.03 SYSTEM DESCRIPTION:

- A. Precast sections shall conform in shape, size, dimensions, materials, and other respects to the details indicated on the drawings or as required by the Engineer.
- B. All manholes shall have concrete bases. Concrete bases shall be precast unless otherwise specified. Invert channels shall be formed of brick and mortar upon the base.
- C. Riser and cone sections shall be precast concrete.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM A48	Gray Iron Castings
ASTM C32	Sewer and Manhole Brick
ASTM C144	Aggregate for Masonry Mortar
ASTM C207	Hydrated Lime for Masonry Purposes
ASTM C478	Precast Reinforced Concrete Manhole Sections
ASTM C923	Specification for Resilient

Connectors Between Reinforced  
Concrete Manhole Structures and Pipes

ASTM C1244

Standard Test Method for Concrete Sewer Manholes by the  
Negative Air Pressure (Vacuum) Test.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M198 Joints for Circular Concrete Sewer and Culvert Pipe Using  
Flexible Watertight Gaskets

Occupational Safety and Health Administration

OSHA 29 CFR 1910.27

Fall Prevention Protection

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL  
SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six (6) sets of manufacturer literature of the materials of this section shall be submitted to the Engineer for review.
- B. Test reports as required shall be submitted to the Engineer.

PART 2 - PRODUCTS

2.01 PRECAST CONCRETE SECTIONS:

- A. All precast concrete sections shall conform to ASTM C478 with the following exceptions and additional requirements:
  - 1. The wall thickness of precast sections shall be as designated on the drawings, meeting the following minimum requirements:

<u>Section Diameter (Inches)</u>	<u>Minimum Wall Thickness (Inches)</u>
48	5
60	6
72	7
84	8

- 2. Type II cement shall be used except as otherwise approved.
- 3. Sections shall be steam cured and shall not be shipped until at least five days after having been cast.
- 4. Minimum compressive strength of concrete shall be 4000 psi at 28 days.

5. No more than two lift holes may be cast or drilled in each section.
  6. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the inside of each precast section.
  7. Acceptance of the sections will be on the basis of material tests and inspection of the completed product.
  8. Circumferential steel reinforcement in walls and bases shall be a minimum of 0.12 sq. in./lin. ft. for 4-foot diameter sections and 0.15 sq. in./lin. ft. for 5- and 6-foot diameter sections. Reinforcing shall extend into tongue and groove.
- B. Conical reducing sections shall have a wall thickness not less than 5-inches at the bottom and wall thickness of 8-inches at the top. Conical sections shall taper from a minimum of 48-inches diameter to 24 or 30-inches diameter at the top, as shown on the drawings.
  - C. Except where insufficient depth of cover dictates the use of a shorter base, bases shall be a minimum of four (4) feet in height.
  - D. Slab top sections and flat riser sections (Grade Rings) shall conform to the contract drawings, with particular attention focused upon the reinforcing steel and be designed to meet or exceed an HS-20 Loading requirement.
  - E. The tops of the bases shall be suitably shaped by means of accurate ring forms to receive the riser sections.
  - F. Precast sections shall be manufactured to contain wall openings of the minimum size to receive the ends of the pipes, such openings being accurately set to conform with line and grade of the sewer or drain. Subsequent cutting or tampering in the field, for the purpose of creating new openings or altering existing openings, will not be permitted except as required by the Engineer.
  - G. The exterior surfaces of all precast manhole bases, walls, and cones shall be given a minimum of one shop coat of bituminous dampproofing.
  - H. The Engineer reserves the right to reject any unsatisfactory precast section and the rejected unit shall be tagged and removed from the job site immediately.
  - I. The Engineer may also require the testing of concrete sections as outlined under Physical Requirements in ASTM C478 with the Contractor bearing all testing costs.
- 2.02 BRICK MATERIALS:
- A. Brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Bricks shall comply with ASTM C32, for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.

- B. Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.
- C. Mortar shall be composed of Portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as required by the Engineer and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SS Brick shall be mixed in the volume proportions of 1:1/2:4-1/2; Portland cement to hydrated lime to sand.
- D. Cement shall be Type II Portland cement as specified for concrete masonry.
- E. Hydrated lime shall be Type S conforming to ASTM C207.
- F. The sand shall comply with ASTM C144 specifications for "Fine Aggregate," except that all of the sand shall pass a No. 8 sieve.

#### 2.03 FRAMES, GRATES, COVERS AND STEPS:

- A. Castings shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.
- B. All castings shall be thoroughly cleaned and may be subject to a careful hammer inspection at the Engineer's discretion.
- C. Castings shall be ASTM A48 Class 30B or better.
- D. The surface of the manhole covers shall have a diamond pattern with the cast words "WATER," "DRAIN" or "SEWER," whichever is appropriate.
- E. Manhole frames with 26-inch covers for 24-inch openings shall be 475 pounds minimum by EJ No. 2110 (formerly LK110A); Neenah Foundry Co. R1720; Quality Water Products, Style 40; or approved equal.
- F. Manhole steps shall conform to ASTM C478 requirements and shall be fabricated of either extruded aluminum or steel reinforced plastic. Steps shall be uniformly spaced at a maximum of 12-inches unless otherwise shown on the drawings.

#### 2.04 SEWER MANHOLE ACCESSORIES:

- A. Gasket materials shall be top grade (100% solids, vulcanized) butyl rubber and shall meet or exceed AASHTO M-198.



- B. Couplings at the manhole-pipe interface shall be made with a rubber seal system (with or without stainless steel straps) meeting the requirements of ASTM C923 and recommended for this type of connection.
- C. Stubs installed as specified and indicated on the drawings shall be short pieces of the same class pipe as that entering the manhole and shall have either stoppers or end caps as shown on the drawings. Stoppers or end caps shall be especially designed for that application.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION:

##### A. PRECAST SECTIONS:

1. Precast bases, 4-foot diameter, shall be supported on a compacted level foundation of crushed stone, as specified in Section 02300, EARTHWORK, at least 6-inches thick, but shall vary to the depth necessary to reach sound undisturbed earth. See Sheet D-2 of the Contract Drawings.
2. The Mystic Street siphon structures shall be supported on a compacted level foundation of crushed stone, as specified in Section 02300, EARTHWORK, at least 12-inches thick, but shall vary to the depth necessary to reach sound undisturbed earth. See Sheet D-3 of the Contract Drawings.
3. Precast reinforced concrete sections shall be set vertical and with sections in true alignment.
4. Butyl rubber joint sealant shall be installed between each concrete section.
5. All holes in sections used for handling the sections shall be thoroughly plugged with mortar. Mortar shall be one part cement to 1-1/2 parts sand, mixed slightly damp to the touch (just short of "balling"), hammered into the holes until it is dense and an excess of paste appears on the surface, and then finished smooth and flush with the adjoining surfaces.

##### B. BRICK WORK:

1. Bricks shall be moistened by suitable means, as required, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
2. Each brick shall be laid as a header in a full bed and joint of mortar without requiring subsequent grouting, flushing or filling, and shall be thoroughly bonded as directed.
3. The brick inverts shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out

in smooth curves of the longest possible radius which is tangent to the centerlines of adjoining pipe.

C. CASTINGS:

1. Cast iron frames, grates and covers shall be as specified. The frames and covers shall be set by the Contractor to conform accurately to the grade of the finished pavement, existing ground surface, or as indicated on the drawings. Frames shall be adjusted to meet the street surface.
2. Cast iron manhole frames and covers not located in paved areas shall be set 6-inches above finished grade, at a height as required by the Engineer, or as indicated on the drawings. The top of the cone shall be built up with a minimum of one (1) course and a maximum of five (5) courses of brick and mortar used as headers for adjustment to final grade.
3. Frames shall be set concentric with the top of the concrete section and in a full bed of mortar so that the space between the top of the concrete section or brick headers and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to be flush with the top of the flange and have a slight slope to shed water away from the frame.
4. Covers and/or grates shall be left in place in the frames, for safety reasons, except while work is being performed.

D. ACCESSORIES:

1. Accessories shall be installed in accordance with manufacturer's instructions.
2. Stubs shall be set accurately to the dimensions indicated on the drawings. Stubs shall be sealed with suitable watertight plugs.

3.02 LEAKAGE TESTS:

- A. Leakage tests shall be made by the Contractor and observed by the Engineer on each manhole. The test shall be by vacuum or by water exfiltration as described below:

B. VACUUM TEST:

1. The vacuum test shall be conducted in accordance with ASTM C1244. Test results will be judged by the length of time it takes for the applied vacuum to drop from 10 inches of mercury to 9 inches. If the time is less than that listed in Table 1 of ASTM C1244, the manhole will have failed the test. Test times from Table 1 are excerpted below.

TABLE 1

## Minimum Test Times for Various Manhole Diameters

<u>Depth (Feet)</u>	<u>Diameter (Inches)</u>		
	48	60	72
	<u>Times (Seconds)</u>		
0-12	30	39	49
12-16	40	52	67
16-20	50	65	81
20-24	59	78	97
26-30	74	98	121

2. If the manhole fails the initial test, the Contractor shall locate the leaks and make proper repairs. Leaks may be filled with a wet slurry of accepted quick setting material. If the manhole should again fail the vacuum test, additional repairs shall be made, and the manhole water tested as specified below.

## 3.02 CLEANING:

All new manholes shall be thoroughly cleaned of all silt, debris and foreign matter of any kind, prior to final inspection.

## 3.03 FIELD TESTING/INSPECTION:

- A. Prior to the expiration of the warranty period, the Contractor shall inspect **each** of the sewer manholes installed during this project in accordance with the Performance Specification Guideline for Manhole Rehabilitation (NASSCO) at a timetable to be approved by the Engineer. The Contractor shall repair any defects found until there are no visible leaks.
- B. All inspecting, testing, and reworking within the warranty period shall be provided at no additional cost to the Owner.

END OF SECTION

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## SECTION 02745

### PAVING

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

The Contractor shall furnish all labor, materials, and equipment and shall replace the pavements as indicated on the drawings and as herein specified.

Due to the significant variations in asphalt prices this contract includes a price adjustment as described in Section 01270, Measurement and Payment.

##### 1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01270, MEASUREMENT AND PAYMENT
- C. Section 01562, DUST CONTROL
- D. Section 02300, EARTHWORK
- E. Section 02631, PRECAST MANHOLES

##### 1.03 SYSTEM DESCRIPTION:

###### A. GENERAL:

The types of pavement systems to be utilized on this project are as follows:

###### B. TYPE A - PERMANENT TRENCH PAVEMENT:

Areas shall be paved with temporary trench binder course pavement, 2 inches thick, as soon as practicable after installation of individual pipeline segments and manholes. Temporary pavement shall be maintained a minimum of 90 days prior to installation of permanent trench binder course pavement, 2½-inches thick and permanent trench top course pavement, 1½-inches thick. This may require that the temporary pavement be maintained until the following year, at which time the permanent pavement shall be installed. Permanent trench binder course and trench top course pavement shall be installed only with the approval of the Engineer.

C. TYPE B - TEMPORARY TRENCH PAVEMENT (MYSTIC STREET ONLY):

Mystic Street areas shall be paved with temporary trench binder course pavement, 3½-inches thick and temporary trench top course pavement 2½-inches thick, as soon as practicable after installation of individual pipeline segments and manholes.

1.04 REFERENCES:

The following standards form a part of these specifications and indicate the minimum standards required:

American Society for Testing and Materials (ASTM)

ASTM D1557 Test for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 Pound Rammer and 18-Inch Drop

Massachusetts Department of Transportation (MassDOT)  
Standard Specifications for Highways and Bridges

MassDOT 403	Reclaimed Base Course
MassDOT 405	Gravel Base Course
MassDOT 420	Hot Mix Asphalt Base Course
MassDOT 460	Hot Mix Asphalt Pavement
MassDOT 476	Cement Concrete Pavement
MassDOT 860	Reflectorized Pavement Markings

Federal Specifications

SS-S-1401 Sealants, Joint, Non-Jet-Fuel-Resistant, Hot Applied, for Portland Cement and Asphalt Concrete Pavement

AASHTO Standard Specifications for Materials and Methods of Sampling and Testing

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six (6) sets of complete job mix formula shall be submitted to the Engineer at least two weeks before any of the work of this section is to begin.

## PART 2 - PRODUCTS

### 2.01 GRAVEL SUBBASE:

- A. Gravel subbase shall consist of inert material that is hard durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials.
- B. Gradation requirements for gravel subbase shall be as specified in Section 02300, EARTHWORK for Gravel Borrow.

### 2.02 RECLAIMED SUBBASE:

- A. Reclaimed subbase shall consist of crushed asphalt pavement, crushed cement concrete, and gravel borrow (as specified in paragraph 2.01) uniformly pre-mixed.
- B. Reclaimed subbase mixtures shall be within the composition limits in accordance with MassDOT M1.11.0, with constituents that conform to Table A, below.
- C. The approved source of reclaimed pavement borrow material shall be processed by mechanical means. The equipment for producing crushed material shall be of adequate size and with sufficient adjustments to produce the desired materials. The processed material shall be stockpiled in such a manner as to minimize segregation of particle sizes. All reclaimed pavement borrow material shall come from approved stockpiles.

### 2.03 HOT MIX ASPHALT PAVEMENT:

- A. Pavements shall consist of hot mix asphalt.
- B. Pavement mixtures shall be within the composition limits of base courses, binder courses, top courses and surface treatment, in accordance with MassDOT M3.11.03, with constituents that conform to Table A, below.

TABLE A  
PERCENT BY MASS PASSING SIEVE DESIGNATION

Standard Sieves (in.)	Reclaimed Subbase	Base Course	Binder Course	Top Course	Mod. Top Course	Surface Treat.	Low Permeability	
							Dense Binder Course	Dense Top Course
3 in	100							
2 in		100						
1-1/2 in	70-100							
1 in		57-87	100		100		100	
3/4 in	50-85		80-100		95-100		80-100	
5/8 in				100				
1/2 in		40-65	55-75	95-100	79-100		65-80	100
3/8 in				80-100	68-88	100		80-100
No.4	30-60	20-45	28-50	50-76	48-68	80-100	48-65	55-80
No.8		15-33	20-38	37-49	33-46	64-85	37-49	48-59
No.16				26-40	20-40	46-68		36-49
No.30		8-17	8-22	17-29	14-30	26-50	17-30	24-38
No.50	8-24	4-12	5-15	10-21	9-21	13-31	10-22	14-27
No.100				5-16	6-16	7-17		6-18
No.200	0-10	0-4	0-5	2-7	2-6	3-8	0-6	4-8
Binder		4-5	4.5-5.5	5.6-7.0	5.1-6	7-8	5.1-6	7-8

Percentages shown for aggregate sizes are stated as proportional percentages of total aggregate for the mix.

Unless authorized by the Engineer, no Job-Mix Formula will be approved which specifies:

- More than 45% passing No. 8 for Top and Dense Binder Courses
- More than 38% passing No. 8 for Modified Top Course
- More than 55% passing No. 8 for Dense Mix
- Less than 4% passing No. 200 for Top Course.
- Less than 6% bitumen for Top Course.

- C. The joint sealant shall be a hot poured rubberized emulsified asphalt sealant meeting the requirements of FS SS-S-1401.
- D. The tack coat shall be an asphalt emulsion, RS-1 if required, conforming to MassDOT Section M3.03.0.

#### 2.04 SEAL COAT:

- A. Seal coats shall be within the composition limits for protective seal coat emulsion in accordance with MassDOT M3.03.3.

- B. Silica sand when blended with seal coat emulsion shall be No. 30 silica sand.

#### 2.05 PAVEMENT MARKINGS:

- A. Pavement markings shall conform to the requirements of MassDOT 860.
- B. The mixture of the marking material shall be within the composition limits for reflectorized pavement markings as described in the MassDOT Specifications as follows:
  - 1. Thermoplastic reflectorized pavement markings - M7.01.03/04.
  - 2. Fast drying traffic paint - M7.01.10/11.
- C. Application of the glass beads to be used as reflector material on the striping shall conform to Sections 860.62 and M7.03.07 of the MassDOT Specifications.

#### 2.06 PAINT FOR PARKING LOTS:

- A. Paint for parking lot lines shall conform to Federal Specification TT-P-115-E Type 1. Paint shall be 11-3 PPG Industries, Pittsburgh, PA or approved equal.

### PART 3 - EXECUTION

#### 3.01 GENERAL:

Paving courses required for the project shall be as shown on the drawings and as specified herein. Pavement thicknesses specified are measured in compacted inches. If a pavement course thickness exceeds 2½ compacted inches, the course shall be installed in multiple lifts with each lift not exceeding 2½ compacted inches in thickness.

#### 3.02 GRAVEL SUBBASE:

- A. The gravel subbase to be placed under temporary pavement shall consist of 14-inches of gravel evenly spread and thoroughly compacted. The gravel subbase to be placed under permanent pavement shall consist of 12-inches of gravel evenly spread and thoroughly compacted.
- B. The gravel shall be spread in layers not more than 4-inches thick, compacted measure. All layers shall be compacted to not less than 95 percent of the maximum dry density of the material as determined by ASTM D1557 Method C at optimum moisture content.

#### 3.03 RECLAIMED SUBBASE:

- A. The reclaimed borrow material to be placed under the pavement shall consist of 12-inches of reclaimed borrow material evenly spread and thoroughly compacted.



- B. The reclaimed borrow material shall be spread and compacted in layers not exceeding 4-inches thick, compacted measure, except the last layer of reclaimed pavement borrow material shall be 2-inches thick, compacted measure. All layers shall be compacted to not less than 95 percent of the maximum dry density of the material as determined by ASTM D1557 Method C at optimum moisture content.

3.04 TYPE A - TEMPORARY BITUMINOUS PAVEMENT:

- A. Where specified and required by the Engineer and after placement of the gravel subbase, the Contractor shall place temporary bituminous pavement above the trench, between the edges of the existing pavement. It shall consist of hot mix asphalt, 2-inches thick, in accordance with MassDOT 460.
- B. The temporary pavement shall be repaired as necessary to maintain the surface of the pavement until replaced by permanent pavement. When so required by the Engineer, the Contractor shall remove the temporary pavement and install or regrade the subbase for installation of permanent pavement.

3.05 TYPE A - PERMANENT BITUMINOUS PAVEMENT:

- A. The bituminous paving mixture, equipment, methods of mixing and placing, and the precautions to be observed as to weather, condition of base, etc., shall be in accordance with MassDOT 460.
- B. BASE COURSE AND BINDER COURSE PAVEMENT:
  - 1. Immediately prior to installing the 2½-inch thick base and/or binder course, the trimmed edges shall be made stable and unyielding, free of loose or broken pieces and all edges shall be thoroughly broomed clean. Contact surfaces of trench sides, curbs, manholes, catch basins, or other appurtenant structures in the pavement shall be painted thoroughly with a uniform coating of asphalt emulsion (tack coat), just before any mixture is placed against them.
  - 2. The binder course shall be repaired as necessary to maintain the surface of the pavement until placement of the permanent overlay. If required, the Contractor shall place a leveling course before placing the permanent overlay.
- C. TOP COURSE OR SURFACE TREATMENT PAVEMENT (PERMANENT OVERLAY):
  - 1. 1½-inch thick top course or surface treatment shall be placed over the trench or full width as shown on the drawings or as specified.
  - 2. Prior to placement of the top course or surface treatment, the entire surface over which the top course or surface treatment is to be placed shall be broom cleaned and tack coated.

3. Top course or surface treatment pavement placed over trenches may be feathered to meet existing paved surfaces, if approved by the Engineer.
4. Prior to placing full width top course or surface treatment pavements, keyways shall be cut in all intersecting streets.

3.06 TYPE B - TEMPORARY BITUMINOUS PAVEMENT:

- A. The bituminous paving mixture, equipment, methods of mixing and placing, and the precautions to be observed as to weather, condition of base, etc., shall be in accordance with MassDOT 460.

B. TEMPORARY BASE COURSE AND BINDER COURSE PAVEMENT:

1. Immediately prior to installing the 3½-inch thick base and/or binder course, the trimmed edges shall be made stable and unyielding, free of loose or broken pieces and all edges shall be thoroughly broomed clean. Contact surfaces of trench sides, curbs, manholes, catch basins, or other appurtenant structures in the pavement shall be painted thoroughly with a uniform coating of asphalt emulsion (tack coat), just before any mixture is placed against them.
2. The binder course shall be repaired as necessary to maintain the surface of the pavement until placement of the permanent overlay. If required, the Contractor shall place a leveling course before placing the permanent overlay.

C. TEMPORARY TOP COURSE OR SURFACE TREATMENT PAVEMENT (PERMANENT OVERLAY):

1. 2½-inch thick top course or surface treatment shall be placed over the trench or full width as shown on the drawings or as specified.
2. Prior to placement of the top course or surface treatment, the entire surface over which the top course or surface treatment is to be placed shall be broom cleaned and tack coated.
3. Top course or surface treatment pavement placed over trenches may be feathered to meet existing paved surfaces, if approved by the Engineer.
5. Prior to placing full width top course or surface treatment pavements, keyways shall be cut in all intersecting streets.

3.07 PAVEMENT PLACEMENT:

- A. Unless otherwise permitted by the Engineer for particular conditions, only machine methods of placing the pavement shall be used. The equipment for spreading and finishing shall be mechanical, self-powered pavers, capable of spreading and finishing

the mixture true to line, grade, width and crown. The mixtures shall be placed and compacted only at such times as to permit proper inspection and checking by the Engineer.

- B. After the paving mixtures have been properly spread, initial and intermediate compaction shall be obtained by the use of steel wheel rollers having a weight of not less than 240 pounds per inch width of tread.
- C. Final rolling of the top course or surface treatment pavement shall be performed by a steel wheel roller weighing not less than 285 pounds per inch width of tread at a mix temperature and time sufficient to allow for final smoothing of the surface and thorough compaction.
- D. Immediately after placement of top course or surface treatment pavement, all joints between the existing and new top course or surface treatment pavements shall be sealed with hot poured rubberized asphalt joint sealant.
- E. Where there is no backing for the edges of the curb-to-curb pavement, the Contractor shall provide a gravel transition. The gravel transition shall be installed immediately after the pavement is placed, shall be feathered and extend a minimum of 18-inches, and shall be compacted using the same equipment as for pavement compaction. The gravel shall be uniformly graded material with a maximum size of 3/8- to 1/2-inch.
- F. When required by the Engineer, the Contractor shall furnish and install additional paving to provide satisfactory transition for driveways and walkways impacted by a new curb-to-curb pavement installation. The transition installation will be considered incidental to the curb-to-curb pavement installation.

### 3.08 ADDITIONAL PAVING:

- A. If the Engineer determines that the existing bituminous concrete pavement on local streets is thicker than the permanent pavement specified herein, the Contractor may be required to install hot mix asphalt to obtain the depth of the existing pavement.
- B. If for the installation of full width paving, the Engineer determines that the existing road surface requires additional leveling pavement, then the Contractor shall install additional hot mix asphalt to bring the section to proper line and cross section. Additional paving required to restore the proper line and cross section of binder course installed by the Contractor which has become rough and uneven shall be furnished and installed at the expense of the Contractor.

### 3.09 PARKING LOTS AND DRIVEWAYS:

- A. Pavement shall consist of a 2-inch binder course and a 1½-inch top course on a 12-inch gravel sub-base. All thicknesses are compacted thicknesses.

- B. Adjacent concrete work, slate work, sidewalks, structures, etc., shall be protected from stain and damage during the entire operation. Damaged or stained areas shall be replaced or repaired to equal their original condition.
- C. All joints between binder and top course shall be staggered a minimum of 6-inches.
- D. After final rolling, no vehicular traffic of any kind shall be permitted on the pavement until it has cooled and hardened sufficiently to prevent distortion and loss of fines, and in no case in less than 6 hours.
- E. Smoothness of all areas of the finished surface shall not vary more than 1/4-inch when tested with a 16 foot straight-edge, applied both parallel to and at right angles to the centerline of the paved area. At building entrances, curbs, and other locations where an essentially flush transition is required, pavement elevation tolerance shall not exceed plus or minus 1/8-inch. Irregularities exceeding these amounts, or which retain water on the surface, shall be corrected by removing the defective work and replacing or repairing it to the satisfaction of the Engineer.
- F. The surface area to be seal coated, swept, and air cleaned. The first coat shall be applied with eight (8) pounds of #30 silica sand blended with each gallon of emulsion applied at a rate of 0.15 gallons per square yard. The second coat shall be a straight sealer applied at the rate of 0.1 gallons per square yard.
- G. The Contractor shall prepare the pavement surface for painting lines according to the recommendations of the paint manufacturer. Applied markings shall have clean-cut edges, true and smooth alignment and uniform film thickness of 15 mils, +/- 1.0. The Contractor shall be responsible for removing, to the satisfaction of the Engineer, tracing marks, and spilled paint applied in an unauthorized area.

### 3.10 RAISING AND ADJUSTING CASTINGS:

- A. In areas of permanent top course paving, existing municipally-owned catch basins, manhole castings, and valve boxes shall be raised to the proper grade where required by the Engineer.
- B. Castings owned by private utilities shall be raised by their own forces. The Contractor shall be responsible for coordinating this work.
- C. The method of adjusting these castings shall be as follows: Cut around catch basin or manhole castings a minimum of 8-inches from casting. Excavate and if required rebuild up to 12-inches of masonry below the bottom of the casting. Backfill with suitable material and compact to bottom of casting. Place high, early strength cement or bituminous concrete collar, as directed, to approximately 1½-inches below the raised casting grade. Masonry work shall conform to Section 02631, PRECAST MANHOLES.
- D. In some areas, raising of castings may not be required. Where required by the Engineer, castings not to be raised shall have at least 12-inches of bituminous concrete pavement

chipped and removed around the casting. New bituminous concrete pavement shall be placed and compacted around such castings to approximately 1½-inches below the top of the casting. The overlay course shall then be sloped down to the level of the casting.

- E. The method of raising valve boxes shall be as follows: Cut around valve box a minimum of 8-inches from valve box. Excavate as required and raise the valve box. Pour high early strength cement or bituminous concrete collar, as directed, to approximately 1½-inches below the top of the valve box.
- F. Castings which need to be raised or adjusted to complete permanent curb to curb paving shall be done immediately prior to paving.

### 3.11 PAVEMENT MARKINGS:

- A. The Contractor shall replace all pavement markings removed or covered-over in carrying out the work, and as required by the Engineer, no sooner than 48 hours after completion of permanent pavement. The markings shall be 4-inches wide, white or yellow, single or double lines as required.
- B. When required by the Engineer, the Contractor shall provide temporary markings at no additional cost to the Owner.

### 3.12 PAVEMENT REPAIR:

- A. If required in the contract or if permanent pavement becomes rough or uneven, permanent pavement patches and trenches shall be repaired and brought to grade utilizing "infrared" paving methods following completion of the construction.
- B. The Contractor performing the work shall use care to avoid overheating the pavement being repaired.
- C. Pavement repair shall extend a minimum of 6-inches beyond all edges of the pavement patch to assure adequate bonding at the pavement joints.

END OF SECTION

## SECTION 02771

### CURBING

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This section covers furnishing and installation of granite curb, bituminous concrete curb and precast parking curb, where required, as shown on the Drawings and herein specified.
- B. This section also covers replacement of curbing removed during construction.

##### 1.02 RELATED WORK:

- A. Required earthwork is specified under Section 02300, EARTHWORK.
- B. Section 02745, PAVING
- C. Section 02775, SIDEWALK CONSTRUCTION AND REPLACEMENT

##### 1.03 REFERENCES:

The following standards form a part of these specifications, as referenced:

Massachusetts Department of Transportation (MassDOT) Standard Specifications for  
Highways and Bridges

##### 1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six (6) sets of shop drawings, showing dimensions of typical curb sections, shall be submitted to the Engineer for review.

#### PART 2 - PRODUCTS

##### 2.01 GRANITE CURBING:

- A. Granite curbing shall be Type VAI conforming to Subsection M9.04.1 of the latest edition of the MassDOT Standard Specifications for Highways and Bridges.
- B. Special shapes and corners shall be supplied as required.

2.02 GRANITE EDGING:

- A. Granite edging shall be Type SB conforming to Subsection M9.04.2 of the latest edition of the MassDOT Standard Specifications for Highways and Bridges.
- B. Special shapes and corners shall be supplied as required.

2.03 HOT MIX ASPHALT CURB:

Curb shall conform to Subsection M3.12.0 of the latest edition of the MassDOT Standard Specifications for Highways and Bridges.

2.04 PRECAST PARKING LOT CURB:

- A. Precast parking lot curb shall be formed with concrete rated at 3500 psi at 28 days.
- B. The manufacturer shall maintain at the manufacturing site a record of material used and their sources, and a copy of concrete mix designs.
- C. Precast parking lot curb shall be the Standard Precast Bumper Curb as manufactured by Durastone Co., Lincoln, RI, or approved equal.

PART 3 - EXECUTION

3.01 GRANITE CURBING:

- A. Removal and resetting and/or removal and replacing of granite curbing shall be in accordance with Section 580 of the latest edition of the MassDOT Standard Specifications for Highways and Bridges. The curbing shall have a 7-inch reveal unless otherwise required by the Engineer.
- B. Except as modified herein or on the drawings, installation of curbing shall conform to Section 500 of the MassDOT Standard Specifications for Highways and Bridges.
- C. Excavation shall be made to the bottom of the 6-inch gravel base below the curbing, the trench being sufficiently wide to permit thorough tamping. The base shall be compacted to a firm, even surface and shall be approved by the Engineer.
- D. The curbing shall be set on edge and settled into place with a heavy wooden hand-rammer, to the line and grade required, straight and true for the full depth. The joints of the stone curbing shall be pointed with mortar for the full depth of the curbing. At approximately 50-foot intervals, a 1/2-inch joint shall not be filled with mortar but left free for expansion. The ends of the stone curbing at driveways and intersections shall be cut at a bevel or rounded as required by the Engineer.

- E. The trench for the stone curbing shall be backfilled with approved material; the first layer to be 4-inches in depth, thoroughly rammed; the other layers to be more than 6-inches in depth and thoroughly rammed until the trench is filled.
- F. Where indicated on the plans, or as required, drainage openings shall be made through the curbing at the elevations and of the size required.

### 3.02 GRANITE EDGING:

- A. Except as modified herein and on the drawings, installation of granite edging shall conform to Section 500 of MassDOT Standard Specifications for Highways and Bridges.
- B. The cement concrete base shall be placed on a well-tamped sub-base acceptable to the Engineer, and shall be constructed of 3000 psi concrete, minimum, as shown on the drawings.
- C. The edging shall be set to the proper lines and grades on the concrete base and on a well-tamped sloping gravel surface.

### 3.03 BITUMINOUS CONCRETE CURB:

- A. Replacement of bituminous concrete curbs shall be in accordance with Section 500 of the latest edition of the MassDOT Standard Specification for Highways and Bridges and all amendments thereto. The curbing shall have a 6-inch reveal unless otherwise required by the Engineer.
- B. Unless modified herein, installation shall conform to Section 501.64 of the MassDOT Standard Specifications for Highways and Bridges.
- C. When indicated on the plans, or as directed, drainage openings shall be made through the curb at the elevations and of the size required.

### 3.04 PRECAST PARKING LOT CURBING:

- A. Precast parking lot curbing shall be furnished and installed as directed by the Engineer.
- B. Any units, which are cracked, chipped, spalled, or otherwise damaged, shall be removed and replaced with units meeting the specified requirements.

END OF SECTION



## SECTION 02775

### SIDEWALK CONSTRUCTION AND REPLACEMENT

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

The Contractor shall furnish all labor, materials, equipment and incidentals required to restore gravel sidewalks and/or construct new or replacement hot mix asphalt or cement concrete sidewalks where required or where existing sidewalks are disturbed by the Contractor, as shown on the drawings and described herein. The Contractor shall also furnish all materials and install wheelchair ramps where shown on the drawings or as required by the Engineer.

##### 1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02771, CURBING

##### 1.03 REFERENCES:

The following standards form a part of these specifications, as referenced:

Massachusetts Department of Transportation (MassDOT)  
Standard Specifications for Highways and Bridges

##### 1.04 SUBMITTALS:

- A. The Contractor shall submit six (6) sets of shop drawings and/or materials specifications for each component of the work to be performed under this section of the Specifications.

##### 1.05 SYSTEM DESCRIPTION:

###### A. GRAVEL SIDEWALKS:

Gravel sidewalks shall be restored to a condition at least equal to that existing immediately before the work was started.

###### B. HOT MIX ASPHALT AND CEMENT CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS:

- 1. Except as otherwise indicated, hot mix asphalt and cement concrete sidewalks and wheelchair ramps shall be constructed in accordance with the requirements of Section 701, Sidewalks, Wheelchair Ramps and Driveways, of the latest edition of

the MassDOT Standard Specifications for Highways and Bridges, and all amendments thereto.

2. Wheel chair ramps shall be installed in new sidewalks at intersections in accordance with 521 CMR. When curbs or sidewalks are constructed or reconstructed on one side of the street, curb cuts shall also be installed on the opposite sides of the street, where there is a pedestrian path of travel. Curb cuts shall be located within the crosswalk and/or the pedestrian path of travel.
- C. Water boxes, manhole frames, and all other castings shall be carefully set to the proposed finished grade.
- D. Sidewalks shall not be less than 48-inches in width, excluding curbing. An unobstructed path of travel shall be provided which is at least 36-inches clear, excluding curbing.

## PART 2 - PRODUCTS

### 2.01 HOT MIX ASPHALT SIDEWALKS:

- A. Sidewalks shall consist of hot mix asphalt.
- B. Hot mix asphalt shall conform to the requirements of MassDOT M3.11, Table A, Dense Mix.

### 2.02 CEMENT CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS:

- A. Cement concrete sidewalks shall be constructed with air entrained Cement Concrete with a minimum compressive strength of 4000 psi at 28 days.
- B. Cement concrete shall conform to the requirements of MassDOT M4.02.

## PART 3 - EXECUTION:

### 3.01 HOT MIX ASPHALT SIDEWALKS:

- A. The subgrade for the sidewalks shall be shaped parallel to the proposed surface of the sidewalks and shall be thoroughly rolled and tamped. All depressions occurring shall be filled with suitable material and again rolled or tamped until the surface is smooth and hard in order for a gravel foundation to be placed upon it.
- B. The hot mix asphalt sidewalk shall be a minimum of three (3) compacted inches thick, laid in two courses; 2-inches base course and 1-inch top course. The sidewalk pitch shall be 3/16-inch per foot of width or shall match the existing sidewalk.

3.02. CEMENT CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS:

- A. Concrete for sidewalks and wheelchair ramps shall be a minimum of 4-inches thick. At driveways, the sidewalks shall be 6-inches thick.
- B. The subgrade for the walk or driveway shall be shaped to a true surface conforming to the proposed slope of the walk, thoroughly rolled at optimum moisture content and tamped with a power roller weighing not less than one ton and not more than 5 tons. All depressions occurring shall be filled with suitable material and again rolled or tamped until the surface is smooth and hard.
- C. After the subgrade has been prepared as hereinbefore specified, a subbase of gravel borrow at optimum moisture content shall be placed, thoroughly rolled by a power roller, and tamped. The gravel borrow shall be a minimum of 8-inches in thickness.
- D. The forms for sidewalks shall be smooth, free from warp, strong enough to resist springing out of shape, and deep enough to conform to the thickness of the proposed walk. All mortar or dirt shall be completely removed from forms that have been previously used. The forms shall be well staked, thoroughly braced, and set to the established lines with their upper edge conforming to the grade of the finished walk. The finished walk shall have sufficient pitch from the outside to the edge of the walk to provide for surface drainage. This pitch shall be 1/4-inch per foot unless otherwise required by the Engineer. Before the concrete is placed, the subbase for sidewalks shall be thoroughly dampened until it is moist throughout but without puddles of water.
- E. Concrete shall be conveyed from the place of mixing to the place of deposit in such a manner that no mortar will be lost, and the composition of the mix shall be uniform, showing neither excess nor lack of mortar in any one place. The consistency shall be such that water will float to the surface under heavy tamping. The concrete shall be placed as close to its final position as practicable and thoroughly consolidated, with precautions taken not to overwork it while it is still plastic. The concrete shall be thoroughly spaded along the forms or screeds to eliminate voids and honeycombs at the edges. Retempering of concrete will not be permitted.
- F. Concrete shall be placed in alternate slabs not exceeding 30 feet in length. Slabs shall be separated by transverse preformed expansion joint filler 1/2-inch thick. The surface of all concrete sidewalks shall be uniformly scored into block units of not more than 40 square feet. The depth of the scoring shall be at least one quarter of the thickness of the sidewalk.
- G. When concrete sidewalks are constructed adjacent to curbing, building foundations, retaining walls, light pole bases or fixed structures, 1/2-inch thick premolded joint filler shall be used between the newly constructed sidewalk and the structure.
- H. Finishing of the concrete surface shall be done by experienced and competent cement finishers as soon as is practicable. Finishing shall be delayed until all bleed water and water sheen has left the surface and the concrete has begun to stiffen. The concrete surface shall be finished as directed with a steel trowel or wood float to give a smooth,

uniform and attractive surface finish and uniformly scored into block units or areas of not more than 36 square feet. Following this, the Contractor shall draw a nylon push broom lightly over the surface to produce a non-slip surface. Application of neat cement to the surface to hasten hardening is prohibited.

- I. The Contractor shall protect the newly placed concrete surface against vandalism and marking or defacing and must stand ready to replace any blocks which, in the opinion of the Engineer, are excessively marked or defaced, at no additional cost to the Owner. When completed the walks shall be kept moist and protected from traffic and weather for at least 3 days.
- J. Adequate protection shall be provided where temperatures of 40°F or lower occur during placing of concrete and during the early curing period. The minimum temperature of fresh concrete after placing and for the first 3 days shall be maintained above 55°F. In addition to the above requirements, an additional 3 days of protection from freezing shall be maintained.

#### END OF SECTION

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## SECTION 02920

### LOAMING AND SEEDING

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This section covers all labor, materials, and equipment necessary to do all loaming, seeding and related work as indicated on the drawings and as herein specified. All lawns disturbed by the Contractor's operations shall be repaired as herein specified.

##### 1.02 RELATED WORK:

Not applicable.

##### 1.03 QUALITY ASSURANCE:

- A. For a particular source of loam, the Engineer may require the Contractor to send approximately 10 pounds of loam to an approved testing laboratory and have the following tests conducted:

1. Organic concentration
2. pH
3. Nitrogen concentration
4. Phosphorous concentration
5. Potash concentration

- B. These tests shall be at the Contractor's expense. Test results, with soil conditioning and fertilizing recommendations, shall be forwarded to the Engineer.

##### 1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six (6) sets of information detailing the seed mixes, fertilizers, mulch material, slope protection material (if required) and origin of loam shall be submitted to the Engineer for review.
- B. Three (3) sets of test results shall be submitted to the Engineer for review.

## PART 2 - PRODUCTS

### 2.01 MATERIALS:

#### A. LOAM:

1. Loam shall be a natural, fertile, friable soil, typical of productive soils in the vicinity, obtained from naturally well-drained areas, neither excessively acid nor alkaline, and containing no substances harmful to grass growth. Loam shall not be delivered to the site in frozen or muddy condition and shall be reasonably free of stumps, roots, heavy or stiff clay, stones larger than 1-inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other litter.
2. The loam shall contain not less than 4 percent nor more than 20 percent organic matter as determined by the loss of weight by ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 degrees F.

#### B. LIME:

Lime shall be standard commercial ground limestone containing at least 50 percent total oxides (calcium oxide and magnesium oxide), and 50 percent of the material must pass through a No. 100 mesh sieve with 98 percent passing a No. 2 mesh sieve.

#### C. FERTILIZER:

Fertilizer shall be commercial fertilizer, 10-10-10 fertilizer mixture containing at least 40 percent of organic nitrogen. It shall be delivered to the site in the original sealed containers, each showing the manufacturer's guaranteed analysis. Fertilizer shall be stored so that when used it will be dry and free flowing. No fertilizer shall be used which has not been marketed in accordance with State and Federal Laws, relating to fertilizers.

#### D. MULCH:

1. Materials to be used in mulching shall conform to the following requirements:
2. Straw Mulch - Straw Mulch shall consist of stalks or stems of grain after threshing.
3. Wood Fibre Mulch - Wood Fibre Mulch shall consist of wood fibre produced from clean, whole uncooked wood, formed into resilient bundles having a high degree of internal friction and shall be dry when delivered to the project.

#### E. SEED:

1. Seed shall be of an approved mixture, the previous year's crop, clean, high in germinating value, a perennial variety, and low in weed seed. Seed shall be

obtained from a reliable seed company and shall be accompanied by certificates relative to mixture purity and germinating value.

2. Grass seed for lawn areas shall conform to the following requirements:

	Proportion by Weight	Germination Purity	Purity Minimum
Chewing's Fescue	30%	70%	97%
Kentucky 31 Fescue	30%	90%	98%
Kentucky Blue Grass	20%	80%	85%
Domestic Rye Grass	20%	90%	98%

Grass seed for cross-country areas, slopes and other areas not normally mowed shall conform to the following requirements:

	Proportion by Weight	Germination Minimum	Purity Minimum
Creeping Red Fescue	50%	85%	95%
Kentucky 31	30%	85%	95%
Domestic Rye	10%	90%	98%
Red Top	5%	85%	92%
Ladino Clover	5%	85%	96%

F. TEMPORARY COVER CROP:

1. Temporary cover crop shall conform to the following requirements:

	% Weight	Germination Minimum
Winter Rye	80 min.	85%
Red Fescue (creeping)	4 min.	80%
Perennial Rye Grass	3 min.	90%
Red Clover	3 min.	90%
Other Crop Grass	0.5 max.	
Noxious Weed Seed	0.5 max.	
Inert Matter	1.0 max.	

G. SLOPE EROSION PROTECTION:

1. Erosion control blanket shall be 100% degradable plastic mesh with 100% degradable straw or straw/coconut fill. Fill shall be held together by degradable fastening. Weight shall be 0.50 lb/sq. yd. Erosion control blankets shall be applied parallel to direction of water flow. The erosion control blankets shall be by North American Green, Evansville, IN or approved equal. For slopes 2:1 or greater, Model SC150 shall be used. For slopes less than 2:1, Model S150 shall be used.
2. Six inch wire staples shall be placed according to manufacturer's recommendations to anchor the mesh material. Staples shall be designed to decompose.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION:

- A. After approval of rough grading, loam shall be placed on areas affected by the Contractor's operations. Loam shall be at least 6-inches compacted thickness.
- B. Lime shall be applied to bring the pH to 6.5 or, without a soil test, at the rate of 2-3 tons of lime per acre.
- C. Fertilizer shall be applied according to the soil test, or without a soil test, at the rate of 1000 pounds per acre.
- D. Loam shall be worked a minimum of 3-inches deep, thoroughly incorporating the lime and fertilizer into the soil. The loam shall then be raked until the surface is finely pulverized and smooth and compacted with rollers, weighing not over 100 pounds per linear foot of tread, to an even surface conforming to the prescribed lines and grades. Minimum depth shall be 6-inches after completion.

3.02 SEEDING:

- A. Seeding shall be done when weather conditions are approved as suitable, in the periods between April 1 and May 30 or August 15 to October 1, unless otherwise approved.
- B. If there is a delay in seeding, during which weeds grow or soil is washed out, the Contractor shall remove the weeds or replace the soil before sowing the seed, without additional compensation. Immediately before seeding is begun, the soil shall be lightly raked.
- C. Seed shall be sown at the approved rate, on a calm day by machine.
- D. One half the seed shall be sown in one direction and the other half at right angles. Seed shall be raked lightly into the soil to a depth of 1/4-inch and rolled with a roller weighing not more than 100 pounds per linear foot of tread.



- E. The surface shall be kept moist by a fine spray until the grass shows uniform germination over the entire area. Wherever poor germination occurs in areas larger than 3 sq. ft., the Contractor shall reseed, roll, and water as necessary to obtain proper germination.
- F. The Contractor shall water, weed, cut and otherwise maintain and protect seeded areas as necessary to produce a dense, healthy growth of perennial lawn grass.
- G. If there is insufficient time in the planting season to complete the fertilizing and seeding, permanent seeding may be left until the following planting season, at the option of the Contractor or as required by the Engineer. In that event, a temporary cover crop shall be sown. This cover crop shall be cut and watered as necessary until the beginning of the following planting season, at which time it shall be plowed or harrowed into the soil, the area shall be fertilized and the permanent seed crop shall be sown as specified.

### 3.03 PLACING MULCH:

- A. Straw Mulch shall be loosely spread to a uniform depth over all areas designated on the plans, at the rate of 4-1/2 tons per acre, or as otherwise required.
- B. Straw Mulch may be applied by mechanical apparatus, if in the judgment of the Engineer the apparatus spreads the mulch uniformly and forms a suitable mat to control slope erosion. The apparatus shall be capable of spreading at least 80 percent of the hay or straw in lengths of 6-inches or more, otherwise it shall be spread by hand without additional compensation.
- C. Wood Fibre Mulch shall be uniformly spread over certain selected seeded areas at the minimum rate of 1,400 pounds per acre unless otherwise required. It shall be placed by spraying from an approved spraying machine having pressure sufficient to cover the entire area in one operation.

### 3.04 SEEDING AND MULCHING BY SPRAY MACHINE:

- A. The application of lime, fertilizer, grass seed and mulch may be accomplished in one operation by the use of an approved spraying machine. The materials shall be mixed with water in the machine and kept in an agitated state in order that the materials may be uniformly suspended in the water. The spraying equipment shall be so designed that when the solution is sprayed over an area, the resulting deposits of lime, fertilizer, grass seed and mulch shall be equal to the specified quantities.
- B. A certified statement shall be furnished, prior to start of work, to the Engineer by the Contractor as to the number of pounds of limestone, fertilizer, grass seed and mulch per 100 gallons of water.
- C. This statement should also specify the number of square yards of seeding that can be covered with the solution specified above. If the results of the spray operation are

unsatisfactory, the Contractor will be required to abandon this method and to apply the lime, fertilizer, grass seed and mulch by other methods.

### 3.05 INSPECTION AND ACCEPTANCE:

At the beginning of the planting season following that in which the permanent grass crop is sown, the seeded areas will be inspected. Any section not showing dense, vigorous growth at that time shall be promptly reseeded by the Contractor at his own expense. The seeded areas shall be watered, weeded, cut and otherwise maintained by the Contractor until the end of that planting season, when they will be accepted if the sections show dense, vigorous growth.

END OF SECTION

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SECTION 03302  
FIELD CONCRETE

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers concrete and all related items necessary to place and finish the concrete work.
- B. Concrete thrust, and anchor blocks, to be provided at all water main bends, tees, plugs and wyes, and at other locations required by the Engineer shall be installed as specified in this section.
- C. Concrete encasement for piping with shallow cover and for encasement of telephone and electrical duct bank, as required by the Engineer, shall be installed as specified in this section.

1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS

1.03 REFERENCES:

- A. The following standards form a part of this specification:

American Concrete Institute (ACI)

ACI 304	Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
ACI 305	Recommended Practice for Hot Weather Concreting
ACI 306	Recommended Practice for Cold Weather Concreting
ACI SP-66	ACI Detailing Manual
ACI 318	Building Code Requirements for Reinforced Concrete

American Society for Testing and Materials (ASTM)

ASTM A615	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C33	Concrete Aggregates
ASTM C94	Ready-Mixed Concrete
ASTM C143	Test for Slump of Portland Cement Concrete
ASTM C150	Portland Cement
ASTM C260	Air Entraining Admixtures for Concrete
ASTM C494	Chemical Admixtures for Concrete

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six (6) copies of the statement of materials constituting the design of mixes for each size aggregate as required by ASTM C94 shall be submitted to the Engineer within one week following award of the Contract.

PART 2 - PRODUCTS

2.01 CONCRETE:

- A. All concrete, reinforced or non-reinforced shall have a 28-day compressive strength of 3000 psi unless otherwise noted on the design drawings. A minimum of 5.5 sacks of cement per cubic yard and a maximum water cement ratio of 6.9 gallons per sack shall be used.
- B. Concrete shall conform to ASTM C94. The Contractor shall be responsible for the design of the concrete mixtures. Slump shall be a maximum of 4-inches and a minimum of 2-inches, determined in accordance with ASTM C143.
- C. Admixtures shall be as specified in subsection 2.04. No additional admixtures shall be used unless approved by the Engineer.
- D. No additional water, except for the amount indicated by the design mix shall be added to the concrete without the prior permission of the Engineer.

2.02 CEMENT:

The cement shall be an approved brand of American manufactured Portland Cement, Type II conforming to the applicable requirements of ASTM C150.

2.03 AGGREGATES:

- A. Except as otherwise noted, aggregate shall conform to the requirements of ASTM C33.
- B. Maximum size aggregate shall be 3/4-inch.

2.04 ADMIXTURES:

- A. All concrete (unless otherwise directed) shall contain an air entraining agent. Air entrained concrete shall have air content by volume of 4 to 8 percent for 3/4-inch aggregate.
- B. Air entraining agent shall be in accordance with ASTM C260 and shall be Darex AEA, as manufactured by W.R. Grace & Company; Placewel (air entraining Type), as manufactured by Johns Manville; Sika AER as manufactured by Sika Chemical Company; or an approved equal product.
- C. Water reducing agent shall be WRDA, as manufactured by W.R. Grace & Company; Placewel (non-air entraining Type), as manufactured by Johns Manville; Sika Plastiment as manufactured by Sika Chemical Company; or an approved equal product.
- D. Water reducing agent-retarder shall be "Daratard," as manufactured by W.R. Grace & Company; Sika Plastiment as manufactured by Sika Chemical Company; or an approved equal product.

2.05 WATER:

- A. Water for concrete shall be potable, free of deleterious amounts of oil, acid, alkali, organic matter and other deleterious substances.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Before placing concrete, forms and the space to be occupied by the concrete shall be thoroughly cleaned, and reinforcing steel and embedded metal shall be free from dirt, oil, mill scale, loose rust, paint or the material which would tend to reduce the bond.
- B. Earth, concrete, masonry, or other water permeable material against which concrete is to be placed shall be thoroughly saturated with water immediately before concrete is placed.
- C. No concrete shall be placed until the consolidation of the ground and the arrangement and details of forms and reinforcing have been inspected and approved by the Engineer.

3.02 THRUST AND ANCHOR BLOCKS:

- A. Minimum bearing areas for thrust blocks and dimensions of anchor blocks shall be as required by the Engineer.
- B. Concrete for thrust and anchor blocks shall be placed against undisturbed earth, and wooden side forms shall be used to provide satisfactory lines and dimensions. Felt roofing paper shall be placed to protect joints. No concrete shall be placed so as to cover joints, bolts or nuts, or to interfere with the removal of the joints.

3.03 FILL CONCRETE:

- A. Fill concrete shall be placed in those locations as required by the Engineer. Fill concrete shall consist of materials as previously specified, with a minimum 28-day compressive strength of 3000 psi.
- B. Before fill concrete is placed, the following procedures shall be used to prepare surfaces; all dirt, scum and laitance shall be removed by chipping and washing. The clean, roughened base surface shall be saturated with water, but shall have no free water on the surface. A coat of 1:2 cement-sand grout, approximately 1/8-inch thick, shall be well scrubbed into the thoroughly dampened concrete base. The concrete fill shall be placed immediately, before grout has dried or set.
- C. Fill concrete shall be brought to lines and grades as required by the Engineer.

3.04 CONCRETE PLACING DURING COLD WEATHER:

- A. Concrete shall not be placed on frozen ground, and no frozen material or material containing ice shall be used. Materials for concrete shall be heated when temperature is below 40°F, or is expected to fall to below 40°F, within 73 hours, and the concrete after placing shall be protected by covering, heat, or both.
- B. All details of Contractor's handling and protecting of concrete during freezing weather shall be subject to the approval of the Engineer. All procedures shall be in accordance with provisions of ACI 306.

3.05 CONCRETE PLACING DURING HOT WEATHER:

- A. Concrete just placed shall be protected from the direct rays of the sun and the forms and reinforcement just prior to placing, shall be sprinkled with cold water. The Contractor shall make every effort to minimize delays, which will result in excessive mixing of the concrete after arrival on the job.

- B. During periods of excessively hot weather (90°F or above), ingredients in the concrete shall be cooled insofar as possible and cold mixing water shall be used to maintain the temperature of the concrete at permissible levels all in accordance with the provisions of ACI 305. Any concrete with a temperature above 90°F, when ready for placement, will not be acceptable, and will be rejected.

### 3.06 FIELD QUALITY CONTROL:

- A. Concrete inspection and testing shall be performed by the Engineer or by an inspection laboratory, designated by the Engineer, engaged and paid for by the Owner. Testing equipment shall be supplied by the laboratory, and the preparation of samples and all testing shall be performed by the laboratory personnel. Full assistance and cooperation, concrete for samples, and such auxiliary personnel and equipment as needed shall be provided by the Contractor.
- B. At least 4 standard compression test cylinders shall be made and tested and 1 slump test from each day's placement of concrete. A minimum of four compression test cylinders shall be made and tested for each 100 cubic yards of each type and design strength of concrete placed. One cylinder shall be tested at 7 days, and two at 28 days. The fourth cylinder from each set shall be kept until the 28-day test report on the second and third cylinders in the same set has been received. If the average compressive strength of the two 28-day cylinders do not achieve the required level, the Engineer may elect to test the fourth cylinder immediately or test it after 56 days. If job experience indicates additional cylinder tests or other tests are required for proper control or determination of concrete quality, such tests shall be made.
- C. The Engineer shall have the right to reject concrete represented by low strength tests. Rejected concrete shall be promptly removed and replaced with concrete conforming to the specification. The decision of the Engineer as to whether substandard concrete is to be accepted or rejected shall be final.

END OF SECTION

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## APPENDIX A

### TELEVISION INSPECTION AND MANHOLE INSPECTION REPORTS



## TELEVISION INSPECTION REPORTS

# TELEVISION INSPECTION SUMMARY

PHASE # 10 SANITARY SEWER REHABILITATIONS - ARLINGTON, MA

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
HIGH HAITH ROAD	12	043	12	027	VC	8	271	271	3	3/7/2014	LIGHT	
<b>Footage</b>												
	000	START TV			0				UPSTREAM MANHOLE			
	053	BRKP			0				MODERATE CRACK			
	053	SVC		03	0				FACTORY, ACTIVE			
	057	RTS			0				HAIRLINE ROOTS IN JOINT, START			
	072	SVC		12	0				FACTORY, ACTIVE, POSSIBLY CAPPED			
	077	RTS			0				HAIRLINE ROOTS IN JOINT, END			
	085	RTS			0				HAIRLINE ROOTS IN JOINT			
	094	CRKP			0				HAIRLINE CRACK			
	106	CIRCRK			144				LIGHT CRACK, INFILTRATION STAINS			
	107	SVC		12	0				FACTORY, ACTIVE			
	108	LKJT			0				INFILTRATION STAINS			
	120	LKJT			0				INFILTRATION STAINS			
	142	SVC		12	0				FACTORY, ACTIVE			
	153	CRKP			0				LIGHT CRACK			
	160	SVC		12	0				FACTORY, CAPPED			
	162	SVC		12	0				FACTORY, CAPPED			
	163	RTS			0				MODERATE ROOTS IN JOINT			
	171	RTS			0				HAIRLINE ROOTS IN JOINT			
	177	RTS			0				HAIRLINE ROOTS IN JOINT			
	180	CIRCRK			0				LIGHT CRACK			
	191	SVC		12	0				FACTORY, CAPPED			
	192	RTS			288				MODERATE ROOTS IN JOINT			
	192	SVC		12	0				FACTORY, ACTIVE			
	197	CRKP			0				HAIRLINE CRACK			
	200	CRKP			0				LIGHT CRACK			

212	RTS	0								HAIRLINE ROOTS IN JOINT				
218	RTS	0								HAIRLINE ROOTS IN JOINT				
222	SVC	12	0							FACTORY, CAPPED				
224	SVC	12	0							FACTORY, CAPPED				
225	RTS		0							HAIRLINE ROOTS IN JOINT				
254	PIPE RPR STAR		0							CHANGES TO PVC				
255	END TV		0							INSPECTION FINISHED, CAN'T PASS OFFSET JOINT				
255	OFSTJT		0							JOINT OFFSET, DROPPED 2-INCHES				
261	OFSTJT		0							PVC REPAIR DROPPED 2"				
261	PIPE RPR END		1,440							PVC PIPE REPAIR, POOR, LEAKING AT FERNCO DURING DYE FLOOD				
271	START TV		0							DOWNSTREAM MH, REVERSAL				

Street	Start Subarea	Start Manhole	End Manhole	End Subarea	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
FOUNTAIN ROAD	18	022	021	18	VC	8	327	327	3	3/17/2016	LIGHT	

Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments
000	START TV		0	UPSTREAM SMH 18022
002	CIRCRK		0	LIGHT CRACK
009	LKJT		720	LEAKING 5:00
017	LKJT		720	INFILTRATION STAIN, LEAKING 7:00
021	OFSTJT		0	HALF INCH OFFSET, INFILTRATION STAIN
024	LKJT		288	INFILTRATION STAIN, LEAKING 7:00
036	SVC	03	0	FACTORY, CAPPED
038	SVC	09	0	FACTORY, ACTIVE
040	RTS		0	LIGHT ROOTS IN JOINT
043	LKJT		288	INFILTRATION STAIN, LEAKING 7:00
046	LKJT		432	LEAKING 5:00
051	OFSTJT			HALF INCH OFFSET
055	LKJT		288	LEAKING 7:00
059	LKJT		720	LEAKING 7:00 AND 5:00
061	SVC	03	0	FACTORY, CAPPED
063	SVC	03	0	BREAK IN, ACTIVE, FAIR
063	SVC	09	0	FACTORY, POSSIBLY ACTIVE

087	SVC	03	0	0	FACTORY, CAPPED
100	RTS		0	0	LIGHT ROOTS IN JOINT
102	SVC	09	0	0	FACTORY, CAPPED
115	SVC	01	0	0	BREAK IN, ACTIVE, POOR
119	SVC	03	0	0	FACTORY, CAPPED
140	SVC	10	0	0	BREAK IN, ACTIVE, POOR
148	SVC	09	0	0	FACTORY, CAPPED
150	SVC	03	0	0	FACTORY, CAPPED
165	SVC	02	0	0	BREAK IN, ACTIVE, FAIR
171	SVC	02	0	0	FACTORY, CAPPED
198	SVC	03	0	0	FACTORY, CAPPED
200	SVC	09	0	0	FACTORY, ACTIVE
209	LKJT		432		LEAKING 7:00 AND 5:00
210	LKJT		576		LEAKING 7:00 AND 5:00
220	SVC	02	0	0	BREAK IN, ACTIVE, FAIR
224	SVC	03	0	0	FACTORY, CAPPED
228	LKJT		288		LEAKING 5:00
230	SVC	09	0	0	FACTORY, CAPPED
241	LKJT		0	0	INFILTRATION STAIN, CONTINUOUS
247	BRKP		0	0	MINOR BREAK IN JOINT
252	LKJT		144		INFILTRATION STAINS END
253	SVC	03	0	0	FACTORY, CAPPED
255	SVC	09	0	0	FACTORY, ACTIVE, 1-INCH OFFSET JOINT IN SERVICE
256	MNLDEP		0	0	LIGHT MINERAL DEPOSITS IN JOINT, CONTINUOUS
276	MNLDEP		288		LIGHT MINERAL DEPOSITS END
278	SVC	03	144		FACTORY, CAPPED, INFILTRATION STAINS
280	SVC	09	0	0	FACTORY, CAPPED
284	LKJT		0	0	INFILTRATION STAIN & MINERAL DEPOSITS, CONTINUOUS
321	MNLDEP		576		LIGHT MINERAL DEPOSITS END
327	END TV		0		INSPECTION FINISHED, DOWNSTREAM SMH 18021

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
FOUNTAIN ROAD	18	023	18	022	VC	8	326	326	3	3/17/2016	LIGHT	
<b>Footage</b>												
	000	START TV			0			UPSTREAM SMH 18023				
	002	CIRCRK			0			MODERATE CRACK AT MANHOLE				
	005	MULTCRKS			144			LIGHT CRAKS IN JOINT, INFILTRATION STAIN				
	009	SVC	09		0			FACTORY, CAPPED				
	018	LKJT			0			INFILTRATION STAIN				
	024	LKJT			0			INFILTRATION STAIN				
	033	CIRCRK			0			LIGHT CRACK IN JOINT				
	034	SVC	03		0			FACTORY, CAPPED				
	036	SVC	09		0			FACTORY, CAPPED				
	045	LKJT			0			INFILTRATION STAIN				
	062	LKJT			720			INFILTRATION STAIN, LEAKING 5:00 & 7:00				
	067	SVC	03		0			FACTORY, CAPPED, INFILTRATION STAINS				
	069	SVC	09		0			FACTORY, ACTIVE, OPEN JOINT IN SERVICE				
	070	LKJT			144			INFILTRATION STAIN				
	074	LKJT			0			INFILTRATION STAIN				
	075	SVC	12		0			BREAK IN, ACTIVE, GOOD, SHORT CHIMNEY				
	084	CRKP			0			LIGHT LONGITUDINAL CRACK				
	086	LKJT			0			INFILTRATION STAIN				
	090	LKJT			0			INFILTRATION STAIN				
	095	LKJT			144			INFILTRATION STAIN				
	096	SVC	03		0			FACTORY, CAPPED				
	098	SVC	09		0			FACTORY, ACTIVE, OPEN JOINT IN SERVICE, SOIL VISIBLE				
	106	LKJT			432			LEAKING 5:00				
	129	SVC	03		0			FACTORY, CAPPED				
	129	SVC	03		0			FACTORY, CAPPED				
	131	SVC	09		0			FACTORY, ACTIVE				
	148	LKJT			864			LEAKING 5:00 & 7:00				
	162	SVC	03		0			FACTORY, CAPPED				

164	SVC	09	0	0	FACTORY, CAPPED	
176	BRKP		0	0	MINOR BREAK IN JOINT	
187	SVC	01	0	0	BREAK IN, ACTIVE, FAIR	
195	SVC	03	0	0	FACTORY, CAPPED	
197	SVC	09	0	0	FACTORY, ACTIVE, BROKEN/OPEN JOINT IN SERVICE, SOIL VISIBLE	
199	CIRCRK		0	0	HAIRLINE CRACK IN JOINT	
201	CIRCRK		0	0	LIGHT CRACK IN JOINT	
210	LKJT		576		LEAKING 5:00 & 7:00	
215	SVC	03	0	0	FACTORY, CAPPED	
217	SVC	09	0	0	FACTORY, CAPPED	
225	LKJT		0	0	INFILTRATION STAIN	
230	SVC	02	0	0	BREAK IN, ACTIVE, FAIR	
252	SVC	02	0	0	FACTORY, CAPPED	
254	SVC	09	0	0	FACTORY, ACTIVE	
258	LKJT		432		LEAKING 7:00	
273	LKJT		144		INFILTRATION STAIN	
277	LKJT		0	0	INFILTRATION STAIN	
278	SVC	03	0	0	FACTORY, CAPPED	
280	SVC	09	0	0	FACTORY, CAPPED, INFILTRATION STAIN	
281	LKJT		0	0	INFILTRATION STAIN	
283	SVC	02	0	0	BREAK IN, ACTIVE, FAIR, INFILTRATION STAINS	
285	LKJT		144		INFILTRATION STAIN	
287	LKJT		0	0	INFILTRATION STAIN	
293	LKJT		0	0	INFILTRATION STAIN	
303	SVC	03	0	0	FACTORY, CAPPED	
305	SVC	09	0	0	FACTORY, ACTIVE, OPEN JOINT IN SERVICE, SOIL VISIBLE	
322	SVC	03	0	0	BREAK IN, ACTIVE, FAIR	
326	END TV		0	0	INSPECTION FINISHED, DOWNSTREAM SMH 18022	

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
FOUNTAIN ROAD	18	025	18	023	VC	8	184	184	2	3/17/2016	LIGHT	

**Footage**   **Defect Code**   **Clock Position**   **Infiltration Rate (gpd)**   **Defect Comments**

000	START TV	0	0	UPSTREAM SMH 18025	
003	BRKP		0	MULTIPLE MODERATE CRACKS	
004	SVC	12	0	FACTORY, ACTIVE, SHORT CHIMNEY	
005	BRKP		432	POOR EXTERNAL REPAIR, LEAKING	
011	LKJT		576	ACTIVELY LEAKING	
013	BRKP		0	MINOR BREAK IN JOINT	
028	MULTCRKS		0	SURFACE CRACKS	
031	SVC	09	0	BREAK IN, ACTIVE, GOOD	
032	CRKP		0	HAIRLINE CRACK IN JOINT	
048	BRKP		0	MINOR BREAK IN JOINT, SOIL VISIBLE 6:00	
050	SVC	09	0	FACTORY, ACTIVE	
052	SVC	03	0	FACTORY, CAPPED, CRACKED CAP	
053	CRKP		0	LIGHT LONGITUDINAL CRACK 12:00	
056	SVC	12	0	BREAK IN, ACTIVE, FAIR, SHORT CHIMNEY	
067	MNLDEP		144	LIGHT MINERAL DEPOSITS IN JOINT	
069	SVC	03	0	FACTORY, CAPPED	
071	SVC	10	0	FACTORY, CAPPED, BROKEN CAP	
076	LKJT		0	INFILTRATION STAINS	
077	SVC	09	0	BREAK IN, ACTIVE, FAIR	
078	LKJT		0	INFILTRATION STAINS	
098	SVC	03	144	FACTORY, ACTIVE, LIGHT MINERAL DEPOSITS	
100	SVC	09	0	FACTORY, CAPPED	
132	CIRCRK		0	LIGHT CRACKS IN JOINT	
141	CIRCRK		0	MODERATE CRACKS IN JOINT	
144	SVC	09	0	FACTORY, CAPPED	
163	SVC	03	0	FACTORY, ACTIVE	
165	SVC	09	0	BREAK IN, ACTIVE, FAIR	
184	END TV		0	INSPECTION FINISHED, DOWNSTREAM SMH 18023	

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
FOUNTAIN ROAD	18	025	18	026	VC	8	228	228	3	3/17/2016	LIGHT	

**Footage**   **Defect Code**   **Clock Position**   **Infiltration Rate (gpd)**   **Defect Comments**

000	START TV	0	DOWNSTREAM SMH 18025
003	SVC	02	FACTORY, ACTIVE
004	BRKP	0	MODERATELY BROKEN ALL AROUND JOINT
007	MULTCRKS	0	SURFACE CRACKS
058	MULTCRKS	0	MULTIPLE CRACKS AROUND SERVICE
058	SVC	09	FACTORY, ACTIVE, 45 DEGREE BEND IN SERVICE
060	SVC	03	FACTORY, ACTIVE
065	BRKP	0	POOR EXTERNAL REPAIR, MULTIPLE MODERATE CRACKS
068	SVC	03	FACTORY, CAPPED
104	SVC	09	FACTORY, ACTIVE
118	SVC	03	FACTORY, ACTIVE
139	SVC	12	FACTORY, CAPPED
140	CRKP	432	LIGHT CRACK, ACTIVELY LEAKING
143	LKJT	0	INFILTRATION STAINS
143	OBST	0	MINOR CEMENT IN JOINT
144	CRKP	0	LIGHT LONGITUDINAL CRACK
146	LKJT	0	INFILTRATION STAINS
149	CRKP	144	LIGHT CRACK IN JOINT, INFILTRATION STAIN
152	OFSTJT	0	HALF INCH OFFSET, CEMENT IN JOINT
153	SVC	10	BREAK IN, ACTIVE, POOR
171	CRKP	0	LIGHT CRACK IN JOINT
173	CRKP	0	MODERATE CRACK AT SERVICE
173	SVC	12	BREAK IN, ACTIVE, FAIR, CHIMNEY
188	SVC	10	FACTORY, ACTIVE
191	CRKP	0	LIGHT CRACK IN JOINT 6:00
210	LKJT	0	INFILTRATION STAIN
215	SVC	03	FACTORY, CAPPED
227	CRKP	0	MODERATE CRACK FROM LAMPHOLE TO CAP
228	BRKP	288	BROKEN CAP, LEAKING
228	END TV	0	INSPECTION FINISHED, UPSTREAM LAMPHOLE 18026



Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
QUINCY STREET	19	005	19	004	VC	8	123	123	3	3/22/2016	LIGHT	
<b>Footage</b>												
	000	START TV			0					UPSTREAM SMH 19005		
	005	SVC		03	0					FACTORY, CAPPED		
	006	CIRCRK			0					MODERATE CRACK		
	010	BRKP			0					MODERATE CRACKS		
	013	CIRCRK			0					LIGHT CRACK		
	013	CIRCRK			0					LIGHT SPIRAL CRACK		
	015	SVC		09	0					FACTORY, ACTIVE		
	018	CIRCRK			0					LIGHT CRACK		
	032	SVC		03	0					BREAK IN, ACTIVE, POOR, VOID UNDER CONNECTION, SOIL VISIBLE		
	033	SVC		09	0					BREAK IN, ACTIVE, POOR		
	034	MULTCRKS			0					MULTIPLE MODERATE CRACKS IN JOINT		
	047	CIRCRK			0					LIGHT CRACK IN JOINT		
	051	BRKP			0					MINOR BREAK IN JOINT		
	051	SVC		09	0					FACTORY, CAPPED		
	052	MULTCRKS			0					MULTIPLE MODERATE CRACKS AROUND SERVICE		
	053	SVC		03	0					FACTORY, CAPPED		
	069	CIRCRK			0					LIGHT CRACK IN JOINT		
	091	CIRCRK			0					LIGHT CRACK IN JOINT		
	092	SVC		10	0					FACTORY, CAPPED		
	105	BRKP			144					4-INCH STONE PUNCTURE, DRIPPING, MINERAL DEPOSITS		
	109	CRKP			144					LIGHT LONGITUDINAL CRACK, INFILTRATION STAIN		
	112	MULTCRKS			144					LIGHT LONGITUDINAL CRACKS, INFILTRATION STAIN		
	123	END TV			0					INSPECTION FINISHED, DOWNSTREAM SMH 19004		

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
QUINCY STREET	19	006	19	005	VC	8	99	99	3	3/22/2016	LIGHT	

**Footage**      **Defect Code**      **Clock Position**      **Infiltration Rate (gpd)**      **Defect Comments**



Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type	
QUINCY STREET	19	008	19	007	VC	8	114	114	3	3/22/2016	LIGHT		
	Footage Defect Code Clock Position Infiltration Rate (gpd) Defect Comments												
	000	START TV				0	UPSTREAM SMH 19008						
	002	MULTCRKS				144	MULTIPLE MODERATE FRACTURES, INFILTRATION STAINS						
	008	LKJT				0	INFILTRATION STAIN						
	010	LKJT				0	INFILTRATION STAIN						
	016	LKJT				0	INFILTRATION STAIN, CONTINUOUS						
	035	LKJT				288	INFILTRATION STAINS END						
	050	MULTCRKS				0	MODERATE CRACKS IN JOINT						
	056	CIRCRK				0	LIGHT SPIRAL CRACK						
	060	SVC				09	0	FACTORY, ACTIVE					
	063	SVC				03	0	FACTORY, ACTIVE					
	080	LKJT				144	INFILTRATION STAIN						
	084	CRKP				0	HAIRLINE CRACK						
	091	SVC				09	0	FACTORY, ACTIVE					
	111	MULTCRKS				0	LIGHT CRACKS						
	114	END TV				0	INSPECTION FINISHED, DOWNSTREAM SMH 19007						
BENJAMIN ROAD	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type	
	19	008	19	016	VC	6	166	2	2	3/22/2016	LIGHT		
	Footage Defect Code Clock Position Infiltration Rate (gpd) Defect Comments												
	000	START TV				0	DOWNSTREAM SMH 19008						
	002	END TV				0	INSPECTION ABANDONED, CAN'T PASS BRICKS AND MORTAR						
002	OBST				0	SMALL BRICK AND MORTAR WALL IN INVERT OF 19008							
QUINCY STREET	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type	
	19	009	19	008	VC	8	149	149	3	3/22/2016	LIGHT		
	Footage Defect Code Clock Position Infiltration Rate (gpd) Defect Comments												
	000	START TV				0	UPSTREAM SMH 19009						

004	LKJT		432						ACTIVELY LEAKING	
005	SVC	09	144						FACTORY, CAPPED, MINERAL DEPOSITS IN CAP	
006	CIRCRK		0						LIGHT CRACK, INFILTRATION STAIN	
009	LKJT		0						INFILTRATION STAIN	
014	CRKP START		0						MULTIPLE LIGHT LONGITUDINAL CRACKS	
024	CRKP END		0							
028	CRKP		0						HAIRLINE CRACK IN JOINT	
031	LKJT		720						ACTIVELY LEAKING	
036	MULTCRKS		0						LIGHT CRACKS	
043	LKJT		144						INFILTRATION STAIN	
050	LKJT		0						INFILTRATION STAIN	
051	SVC	03	0						FACTORY, ACTIVE	
054	SVC	09	0						FACTORY, ACTIVE	
083	SVC	10	144						BREAK IN, ACTIVE, FAIR, STAINS AT CONNECTION	
087	SVC	09	0						FACTORY, CAPPED	
096	CRKP		0						LIGHT LONGITUDINAL CRACK, INFILTRATION STAIN	
096	SVC	03	0						FACTORY, ACTIVE	
103	MNLDEP		144						LIGHT MINERAL DEPOSITS IN JOINT	
105	LKJT		0						INFILTRATION STAIN, CONTINUOUS	
107	CRKP		0						LIGHT LONGITUDINAL CRACK, INFILTRATION STAIN	
143	LKJT		576						INFILTRATION STAINS END	
149	END TV		0						INSPECTION FINISHED, DOWNSTREAM SMH 19008	

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
QUINCY STREET	19	010	19	009	VC	8	168	168	3	3/22/2016	LIGHT	
	<b>Footage</b>	<b>Defect Code</b>	<b>Clock Position</b>	<b>Infiltration Rate (gpd)</b>	<b>Defect Comments</b>							
	000	START TV			0							UPSTREAM SMH 19010
	003	CIRCRK			0							LIGHT SPIRAL CRACK
	005	CIRCRK			432							LIGHT CRACK IN JOINT, ACTIVELY LEAKING
	016	CIRCRK			1,008							LIGHT CRACK IN JOINT, ACTIVELY LEAKING
	024	SVC	03		432							FACTORY, ACTIVE, SERVICE JOINTS LEAKING
	032	LKJT			0							INFILTRATION STAIN

035	LKJT	0										INFILTRATION STAIN
038	LKJT	0										INFILTRATION STAIN
059	CRKP	0										HAIRLINE CRACK IN JOINT
066	CIRCRK	0										HAIRLINE CRACK IN JOINT
077	SVC	03	1,440									FACTORY, ACTIVE, SERVICE JOINTS LEAKING
091	SVC	03	576									FACTORY, CAPPED, CAP LEAKING
092	CIRCRK	0										LIGHT CRACK IN JOINT
106	SVC	03	0									FACTORY, ACTIVE
106	SVC	09	0									BREAK IN, ACTIVE, FAIR
107	SVC	09	0									FACTORY, CAPPED
111	CRKP START		0									MULTIPLE MODERATE HINGE CRACKS
111	LKJT	0										INFILTRATION STAIN
114	CRKP END		0									
118	LKJT		0									INFILTRATION STAIN, CONTINUOUS
138	SVC	09	144									BREAK IN, ACTIVE, FAIR, STAINS AT CONNECTION
147	SVC	03	0									FACTORY, ACTIVE
165	LKJT		720									INFILTRATION STAINS END
168	END TV		0									INSPECTION FINISHED, DOWNSTREAM SMH 19009

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
LEHIGH STREET	19	010	19	018	VC	8	65	65	3	3/22/2016	LIGHT	
	<b>Footage</b>	<b>Defect Code</b>	<b>Clock Position</b>	<b>Infiltration Rate (gpd)</b>	<b>Defect Comments</b>							
	000	START TV			0					DOWNSTREAM SMH 19010		
	008	LKJT			288					ACTIVELY LEAKING		
	012	LKJT			576					ACTIVELY LEAKING		
	015	CIRCRK			0					HAIRLINE SPIRAL CRACK		
	015	LKJT			576					ACTIVELY LEAKING		
	015	LKJT			432					ACTIVELY LEAKING		
	020	MULTCRKS			0					SURFACE CRACKS		
	021	LKJT			288					ACTIVELY LEAKING		
	024	LKJT			1,008					ACTIVELY LEAKING		
	026	MULTCRKS			0					LIGHT CRACKS		



142	SVC	09	1,152	BREAK IN, ACTIVE, FAIR, LEAKING FROM CONNECTION		
143	SVC	03	0	FACTORY, ACTIVE		
145	END TV		0	INSPECTION FINISHED, UPSTREAM LAMP HOLE 19017, LEAKING		
145	NONE		0	LH INFILTRATION VALUE IN MH DATABASE		

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
BENJAMIN ROAD	19	019	19	008	VC	8	158	158	3	3/22/2016	LIGHT	

Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments
000	START TV		0	UPSTREAM SMH 19019
008	SVC	03	144	FACTORY, CAPPED, INFILTRATION STAINS
014	BRKP		144	2-INCH STONE PUNCTURE, LEAKING
014	SVC	03	0	BREAK IN, ACTIVE, FAIR
015	BRKP		144	HALF INCH STONE PUNCTURE, LEAKING
016	SVC	11	0	FACTORY, ACTIVE
019	SVC	03	0	FACTORY, CAPPED
064	SVC	10	0	FACTORY, CAPPED
065	CRKP		0	LIGHT LONGITUDINAL CRACK
091	LKJT		0	INFILTRATION STAIN
093	LKJT		0	INFILTRATION STAIN
096	LKJT		0	INFILTRATION STAIN, CONTINUOUS
097	SVC	09	0	FACTORY, CAPPED
136	CRKP		0	MODERATE LONGITUDINAL CRACK
142	LKJT		432	INFILTRATION STAINS END
148	BRKP		0	MODERATE HINGE CRACKS
155	MULTCRKS		0	LIGHT CRACKS IN JOINT
158	END TV		0	INSPECTION FINISHED, DOWNSTREAM SMH 19008

Street	Start	Start	End	End	Pipe	Pipe	Pipe	TV Pipe	Joint	Date	Debris	Debris Type
	Subarea	Manhole	Subarea	Manhole	Material	Diameter (in)	Length (ft)	Length (ft)	Spacing (ft)	Inspected	Estimated	
BENJAMIN ROAD	19	019	19	020	VC	8	37	37	3	3/22/2016	LIGHT	
Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments								
000	START TV		0	DOWNSTREAM SMH 19019								





043	SVC	03	144	FACTORY, CAPPED, ACTIVELY DRIPPING		
069	SVC	12	0	FACTORY, CAPPED		
078	OTHER		0	POOR EXTERNAL REPAIR		
079	SVC	01	0	BREAK IN, ACTIVE, FAIR		
098	SVC	12	0	FACTORY, CAPPED		
102	SVC	12	0	BREAK IN, ACTIVE, FAIR, SHORT CHIMNEY, LIGHT CRACKS		
144	SVC	12	0	FACTORY, ACTIVE, CHIMNEY, LIGHT ROOTS IN SERVICE		
224	END TV		0	INSPECTION FINISHED, DOWNSTREAM SMH MA228		

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
NORTH UNION STREET	32	002	32	002 A	VC	8	59	59	2	4/5/2016	NONE	

Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments
000	START TV		0	UPSTREAM SMH 32002
002	OPJT		0	1-INCH OPEN JOINT AT MANHOLE
019	SVC	03	144	FACTORY, CAPPED, INFILTRATION STAINS
021	SVC	09	0	FACTORY, CAPPED
059	END TV		0	INSPECTION FINISHED, DOWNSTREAM SMH 32002A

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
NORTH UNION STREET	32	002	32	014	VC	8	151	151	3	4/5/2016	NONE	

Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments
000	START TV		0	DOWNSTREAM SMH 32002
016	GREASE		0	LIGHT GREASE, EVIDENCE OF SURCHARGING, HALF PIPE
016	LKJT		144	INFILTRATION STAIN
019	RTS		0	LIGHT ROOTS IN JOINT
038	LKJT		432	ACTIVELY LEAKING
044	LKJT		432	ACTIVELY LEAKING
084	RTS		0	LIGHT ROOTS IN JOINT
140	RTS		0	MODERATE ROOTS IN JOINT
143	RTS		0	LIGHT ROOTS IN JOINT
148	CRKP		0	LIGHT LONGITUDINAL CRACK

151	END TV	0	INSPECTION FINISHED, UPSTREAM SMH 32014									
Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
NORTH UNION STREET	32	002 A	32	001	VC	8	82	82	2	4/5/2016	NONE	
Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments								
000	START TV		0	UPSTREAM SMH 32002A								
011	LKJT		144	INFILTRATION STAIN								
013	SVC	03	0	FACTORY, CAPPED, INFILTRATION STAINS ON CAP								
015	SVC	09	144	FACTORY, ACTIVE, LEAKING JOINTS								
020	BRKP		720	OLD EXTERNAL REPAIR, POOR, LEAKING								
021	SVC	02	0	BREAK IN, ACTIVE, POOR								
046	SVC	03	0	FACTORY, CAPPED								
048	SVC	09	0	FACTORY, CAPPED								
057	LKJT		0	INFILTRATION STAIN								
082	END TV		0	INSPECTION FINISHED, DOWNSTREAM SMH 32001								
Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
NORTH UNION STREET	32	003	32	002	VC	8	111	111	2	4/5/2016	NONE	
Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments								
000	START TV		0	UPSTREAM SMH 32003								
004	CRKP		0	MODERATE LONGITUDINAL CRACK 12:00								
014	SVC	03	144	FACTORY, CAPPED, INFILTRATION STAINS ON CAP								
015	SVC	09	0	FACTORY, CAPPED								
016	CIRCRK		0	HAIRLINE CRACK IN JOINT								
022	SVC	02	0	BREAK IN, ACTIVE, FAIR								
039	CRKP		144	LIGHT LONGITUDINAL CRACK, INFILTRATION STAINS								
049	LKJT		144	INFILTRATION STAIN								
051	SVC	03	0	FACTORY, CAPPED								
053	SVC	09	0	FACTORY, CAPPED								
062	LKJT		144	INFILTRATION STAIN								
070	LKJT		144	INFILTRATION STAIN								

076	SVC	09	0	0						BREAK IN, ACTIVE, FAIR		
080	SVC	03	0	0						BREAK IN, ACTIVE, FAIR, SMALL VOID UNDER CONNECTION		
091	GREASE		0	0						MINOR GREASE, SIGNS OF SURCHARGING		
097	SVC	03	0	0						FACTORY, CAPPED		
099	SVC	09	0	0						FACTORY, CAPPED		
111	END TV		0	0						INSPECTION FINISHED, DOWNSTREAM SMH 32002		

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
WHEATON ROAD	32	003	32	003 A	VC	8	287	287	3	4/5/2016	NONE	

Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments
000	START TV		0	DOWNSTREAM SMH 32003
056	RTS		0	LIGHT ROOTS IN JOINT
071	CIRCRK		0	LIGHT CRACK IN JOINT
097	SVC	09	0	BREAK IN, ACTIVE, FAIR, SOIL VISIBLE AROUND CONNECTION
105	SVC	03	0	BREAK IN, ACTIVE, FAIR, SOIL VISIBLE AROUND CONNECTION
106	MULTCRKS		0	LIGHT CRACKS
109	MULTCRKS		0	LIGHT CRACKS
138	BRKP		0	HALF INCH STONE PUNCTURE BEGINNING
142	RTS		0	FINE ROOTS IN JOINT
148	RTS		0	FINE ROOTS IN JOINT
160	BRKP		0	LIGHT FRACTURES IN JOINT
171	MULTCRKS		0	LIGHT CRACKS
172	OTHER		0	SERVICE CONNECTION AT 1+72
172	PROTSVC	03	0	BREAK IN, ACTIVE, POOR, SOIL VISIBLE, PROTRUDING HALF INCH
181	BRKP		0	EXTERNAL REPAIR, POOR, MULTIPLE CRACKS AROUND BREAK IN
181	SVC	08	0	BREAK IN, ACTIVE, FAIR
206	CRKP		144	LIGHT LONGITUDINAL CRACK, INFILTRATION STAIN
233	BRKP		0	1-INCH STONE PUNCTURE BEGINNING
237	SVC	03	0	BREAK IN, ACTIVE, FAIR, SOIL VISIBLE AROUND CONNECTION
244	SVC	09	0	BREAK IN, ACTIVE, FAIR
245	BRKP		288	EXTERNAL REPAIR, FAIR, LEAKING
264	BRKP		0	HEAVY FRACTURES IN JOINT

287      END TV      0      INSPECTION FINISHED, UPSTREAM SMH 32003A

Street	Start	Start	End	End	Pipe	Pipe	Pipe	TV Pipe	Joint	Date	Debris	Debris Type
	Subarea	Manhole	Subarea	Manhole	Material	Diameter (in)	Length (ft)	Length (ft)	Spacing (ft)	Inspected	Estimated	
NORTH UNION STREET	32	004	32	302	VC	8	137	137	2	4/5/2016	NONE	
	<b>Footage    Defect Code    Clock Position    Infiltration Rate (gpd)    Defect Comments</b>											
	000	START TV			0						UPSTREAM SMH 32004	
	005	CRKP			144						LIGHT LONGITUDINAL CRACK, INFILTRATION STAIN	
	011	LKJT			0						INFILTRATION STAIN	
	019	LKJT			0						INFILTRATION STAIN	
	024	SVC	03		0						FACTORY, CAPPED	
	026	SVC	09		0						FACTORY, CAPPED	
	036	SVC	02		144						BREAK IN, ACTIVE, POOR, CRACK AT SERVICE, INFILTRATION STAIN	
	039	LKJT			0						INFILTRATION STAIN, CONTINUOUS	
	041	CIRCRK			0						HAIRLINE CRACK IN JOINT	
	047	LKJT			144						INFILTRATION STAINS END	
	058	CRKP			0						LIGHT LONGITUDINAL CRACK	
	061	SVC	03		0						FACTORY, CAPPED	
	063	SVC	09		0						FACTORY, CAPPED	
	098	SVC	03		144						FACTORY, ACTIVE, LIGHT MINERAL DEPOSITS	
	100	SVC	09		0						FACTORY, ACTIVE	
	101	LKJT			0						INFILTRATION STAIN	
	104	CRKP			0						LIGHT LONGITUDINAL CRACK, INFILTRATION STAIN	
	111	LKJT			0						INFILTRATION STAIN	
	113	LKJT			0						INFILTRATION STAIN	
	129	LKJT			0						INFILTRATION STAIN	
	137	END TV			0						INSPECTION FINISHED, DOWNSTREAM SMH 32302	
Street	Start	Start	End	End	Pipe	Pipe	Pipe	TV Pipe	Joint	Date	Debris	Debris Type
	Subarea	Manhole	Subarea	Manhole	Material	Diameter (in)	Length (ft)	Length (ft)	Spacing (ft)	Inspected	Estimated	
NORTH UNION STREET	32	302	32	003	VC	8	135	135	2	4/5/2016	NONE	
	<b>Footage    Defect Code    Clock Position    Infiltration Rate (gpd)    Defect Comments</b>											
000	START TV				0						UPSTREAM SMH 32302	

020	LKJT	144	INFILTRATION STAIN				
035	CRKP	0	LIGHT LONGITUDINAL CRACK AT SERVICE				
035	SVC	02	0	BREAK IN, ACTIVE, FAIR, SMALL VOID UNDER CONNECTION			
038	SVC	03	0	FACTORY, CAPPED			
040	SVC	09	0	FACTORY, CAPPED			
075	SVC	03	0	FACTORY, CAPPED			
077	SVC	09	0	FACTORY, CAPPED			
092	PROTSVC	09	0	BREAK IN, ACTIVE, FAIR, LIGHT CRACKS, PROTRUDING 1-INCH			
099	SVC	02	0	BREAK IN, ACTIVE, FAIR, LIGHT CRACKS			
103	LKJT		0	INFILTRATION STAIN			
112	SVC	03	0	FACTORY, CAPPED			
114	SVC	09	0	FACTORY, CAPPED			
124	LKJT		144	INFILTRATION STAIN			
132	MULTCRKS		0	LIGHT LONGITUDINAL CRACKS			
135	END TV		0	INSPECTION FINISHED, DOWNSTREAM SMH 32003			

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
CUTTER HILL ROAD	37	022	37	023	VC	8	113	113	3	1/18/2017	NONE	

Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments
000	START TV		0	UPSTREAM SMH 37022
021	SVC	12	0	FACTORY, CAPPED
073	MULTCRKS		0	LIGHT CRACKS
081	CRKP		0	LIGHT CRACK
088	CRKP		0	LIGHT CRACK
094	SVC	09	0	FACTORY, ACTIVE
100	SAG START		0	SLIGHT SAG STARTS
113	END TV		0	INSPECTION FINISHED, DOWNSTREAM SMH 37203

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
SUMMER STREET	37	023	37	011	VC	8	24	24	3	1/18/2017	NONE	

Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments
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000	START TV	0	UPSTREAM SMH 37023	
004	CRKP	0	LIGHT CRACK	
018	OTHER	0	FIRST 18 FEET ARE PITCHED THE WRONG WAY	
020	CRKP	0	LIGHT CRACK	
024	END TV	0	INSPECTION FINISHED, DOWNSTREAM SMH 37011	

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
SUMMER STREET	37	024	37	011	VC	8	41	41	3	1/18/2017	NONE	

Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments
000	START TV	0	DOWNSTREAM SMH 37204	
041	END TV	0	INSPECTION FINISHED, UPSTREAM SMH 37011	

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
MILL STREET	37	024	37	301	VC	8	222	222	3	4/11/2016	NONE	

Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments
000	START TV	0	UPSTREAM SMH 37024	
014	LKJT		1,440	ACTIVELY LEAKING
024	LKJT		1,008	ACTIVELY LEAKING
027	LKJT		720	ACTIVELY LEAKING
038	CIRCRK		0	LIGHT SPIRAL CRACK
045	CIRCRK		0	LIGHT CRACK IN JOINT
047	SVC	03	0	FACTORY, CAPPED
049	SVC	09	0	FACTORY, CAPPED
081	LKJT		720	ACTIVELY LEAKING
085	SVC	09	0	FACTORY, CAPPED, LIGHT ROOTS IN CAP
091	SVC	03	0	FACTORY, CAPPED
100	SVC	03	0	BREAK IN, ACTIVE, FAIR
103	CIRCRK		0	LIGHT CRACK AROUND SERVICE
103	PROTSVC	10	0	BREAK IN, ACTIVE, FAIR, PROTRUDING 1-INCH
147	BRKP		0	MINOR BREAK IN JOINT 8:00
147	OFSTJT		0	SLIGHT ALIGNMENT RIGHT

164	PROTSVC	02	0	0						BREAK IN, ACTIVE, FAIR, PROTRUDING HALF INCH	
173	SVC	03	0	0						FACTORY, CAPPED	
174	CIRCRK		0	0						HAIRLINE SPIRAL CRACK	
192	BRKP		0	0						MINOR BREAK IN JOINT 12:00, LIGHT SPIRAL CRACK	
206	SVC	09	0	0						FACTORY, ACTIVE	
222	END TV		0	0						INSPECTION FINISHED, DOWNSTREAM SMH 37301	

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
OLD COLONY ROAD	41	005	41	004	VC	8	277	277	3	4/14/2011	LIGHT	

Footage	Defect Code	Clock Position	Infiltration Rate (gpd)	Defect Comments
000	START TV		0	START TV AT UPSTREAM MH
005	CIRCRK		144	LIGHT CRACK AFTER SVC
005	SVC	09	0	BREAK IN, VOID SPACE, ACTIVE
014	SVC	09	720	FACTORY, ROCKS, INFILTRATION, CAP IS MISSING
016	CRKP		0	LIGHT CRACK AT JOINT
016	RTS		0	LIGHT ROOTS AT JOINT
019	CRKP		0	CRACK EXTENDS FROM JOINT TO CIRCULAR CRACK
021	CIRCRK		0	LIGHT CRACK
022	SVC	03	0	FACTORY, ROCKS/ROOTS, CAP IS MISSING
030	CIRCRK		0	CRACK AT JOINT
033	RTS		0	LIGHT ROOTS AT JOINTS THROUGHOUT
036	CIRCRK		0	CRACK AT JOINT
046	SAG START		0	LIGHT SAG
056	CIRCRK		0	LIGHT CRACK AT JOINT
060	SAG END		0	
067	SAG START		0	LIGHT SAG
073	SVC	10	432	BREAK IN, VOID SPACE, ROOTS, INFILTRATION, ACTIVE
074	CRKP		0	LIGHT CRACK EXTENDS FROM SVC TO JOINT
075	CRKP END		0	
077	SAG END		0	
078	SVC	09	0	FACTORY, DEBRIS/ROCKS/ROOTS, CAP IS MISSING
082	SAG START		0	LIGHT SAG





101	SVC	09	0	BREAK IN, ACTIVE
103	BRKP		0	MODERATE PIECE OF PIPE MISSING, ROCK SHOWING
103	MULTCRKS		0	SEVERE CRACKS AROUND BROKEN PIPE
107	MULTCRKS		0	SEVERE CRACKS AROUND PIPE
112	RTS		0	SEVERE ROOTS IN SERVICE
112	SVC	09	0	FACTORY, CAPPED, CAP POSSIBLY MISSING
124	MULTCRKS		0	MODERATE-SEVERE CRACKS AROUND PIPE
127	RTS		0	MODERATE ROOTS AROUND SERVICE CONNECTION
127	SVC	03	0	BREAK IN, ACTIVE
134	MULTCRKS		0	SEVERE CRACKS AROUND PIPE
141	MULTCRKS		0	SEVERE CRACKS AROUND PIPE
149	MULTCRKS		0	MODERATE-SEVERE CRACKS AROUND PIPE
155	MULTCRKS		0	SEVERE CRACKS AROUND PIPE
160	MULTCRKS		0	SEVERE CRACKS ALONG BOTTOM OF PIPE AT JOINT
165	MULTCRKS		0	SEVERE CRACKS ALONG BOTTOM OF PIPE AT JOINT
168	SVC	03	0	BREAK IN, ACTIVE
170	BRKP		0	SMALL HOLE IN TOP OF PIPE
170	MULTCRKS		0	MODERATE CRACKS AROUND BROKEN PIPE
171	MULTCRKS		0	SEVERE CRACKS AROUND PIPE
172	BRKP		0	PIECE OF PIPE MISSING, VOID VISABLE
174	SVC	03	0	FACTORY, CAPPED, CAP POSSIBLY MISSING
177	MULTCRKS		0	MODERATE-SEVERE CRACKS
193	MULTCRKS		0	MODERATE-SEVERE CRACKS
194	SVC	09	0	FACTORY, CAPPED, CAP POSSIBLY MISSING
196	CRKP		0	MODERATE CRACK ALONG BOTTOM OF PIPE
206	RTS		0	LIGHT ROOTS AT JOINT
209	MULTCRKS		0	SEVERE CRACKS ALONG BOTTOM OF PIPE AT JOINT
212	MULTCRKS		0	MODERATE CRACKS ALONG TOP OF PIPE
214	BRKP		0	OLD EXTERNAL REPAIR, POOR
214	RTS		0	LIGHT ROOTS IN FRACTURE
217	RTS		0	LIGHT ROOTS AROUND SERVICE
217	SVC	09	0	BREAK IN, ACTIVE
220	OFSTJT		0	SLIGHT OFFSET



042	SVC	03	0	0	FACTORY, OFFSET JOINT IN SVC, ACTIVE
053	BRKP		0	0	LIGHT HOLE IN PIPE
090	BRKP		0	0	HOLE IN PIPE, PREVIOUS REPAIR
096	BRKP		0	0	BROKEN PIPE, HOLE, SOIL VISIBLE
101	BRKP		0	0	HOLE IN PIPE, SOIL VISIBLE
110	BRKP		0	0	BROKEN PIPE
110	SAG START		0	0	LIGHT SAG
114	CRKP END		0	0	BROKEN PIPE/CRACKS END
120	SAG END		0	0	
124	BRKP		0	0	BROKEN PIPE NEAR JOINT
129	SVC	09	0	0	BREAK IN, FAIR, ACTIVE
150	SAG START		0	0	MEDIUM TO HEAVY SAG
161	SVC	12	0	0	BREAK IN, FAIR, ACTIVE
163	CRKP		0	0	LIGHT CRACK AT JOINT
169	CRKP		0	0	LIGHT CRACK AT JOINT
169	SAG END		0	0	30% SAG ENDS
171	END TV		0	0	END TV AT DOWNSTREAM MH

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
OLD COLONY ROAD	41	013	41	014	VC	8	179	179	3	4/14/2011	LIGHT	
<b>Footage</b>												
	000	START TV			0					START TV AT UPSTREAM MH		
	009	LKJT			1,008					LIGHT LEAKING AT JOINTS, APPROX. 50% OF JOINTS		
	021	CRKP			0					LIGHT CRACK AT JOINT		
	024	CRKP			0					LIGHT CRACK AT JOINT		
	036	RTS			0					LIGHT ROOTS AT JOINT		
	048	RTS			0					LIGHT ROOTS AT JOINTS THROUGHOUT		
	078	CRKP			0					LIGHT CRACK AT JOINT		
	095	SVC		03	0					BREAK IN, LIGHT ROOTS, VOID SPACE, ACTIVE		
	109	SVC		09	0					BREAK IN, ROOTS, ACTIVE		
	175	CRKP			0					LIGHT SPIDER CRACKING		
	179	END TV			0					END TV AT DOWNSTREAM MH		

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
OLD COLONY ROAD	41	014	41	015	VC	8	203	203	3	4/14/2011	LIGHT	
<b>Footage</b>												
	000	START TV			0					START TV AT UPSTREAM MH		
	021	LKJT			1,440					LIGHT LEAKING AT JOINTS, APPROX. 50% OF JOINTS		
	026	SVC		03	0					BREAK IN, VOID SPACE, ACTIVE		
	037	SVC		09	0					BREAK IN, FAIR, ACTIVE		
	039	CRKP			0					LIGHT CRACK AT JOINT, EXTEND TO ROCK PUNCTURE		
	040	BRKP			0					HOLE IN PIPE, ROCK PUNCTURE		
	100	SVC		09	0					BREAK IN, LIGHT ROOTS, ACTIVE		
	112	SVC		03	0					BREAK IN, LIGHT ROOTS, ACTIVE		
	123	MULTCRKS			0					LIGHT CRACKS, EXTEND 2 LF		
	203	END TV			0					END TV AT DOWNSTREAM MH		

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
WINDMILL LANE	41	015	41	019	VC	8	229	229	3	4/14/2011	LIGHT	
<b>Footage</b>												
	000	START TV			0					START TV AT UPSTREAM MH		
	017	OFSTJT			0					LIGHT OFFSET JOINT		
	023	CRKP			0					CRACK AT JOINT		
	044	LKJT			144					LIGHT LEAKING AT JOINT		
	047	LKJT			432					LIGHT LEAKING AT JOINT		
	056	MULTCRKS			0					LIGHT CRACKS AT JOINT		
	059	LKJT			432					LIGHT LEAKING AT JOINT		
	061	SVC		02	0					BREAK IN, VOID SPACE, ACTIVE		
	105	CRKP			0					LIGHT CRACK AT JOINT		
	106	SVC		09	0					BREAK IN, VOID SPACE, ACTIVE		
	111	LKJT			1,296					LIGHT LEAKING AT JOINTS, APPROX. 50% OF JOINTS		
	162	SVC		09	0					BREAK IN, VOID SPACE, ACTIVE		
	211	CRKP			0					LIGHT CRACK AT JOINT		



059	SAG START	0		
064	SVC	03	0	POOR CAP
065	MULTCRKS		0	LIGHT CRACKS
068	CRKP END		0	
077	SAG END		0	
080	CRKP		0	AT JOINT
085	SVC	03	0	BREAK IN, FAIR
086	SAG START		0	
100	CRKP		0	LIGHT CRACKS
100	SAG END		0	
115	CRKP		0	LIGHT CRACK AT JOINT
119	BRKP		0	LIGHT CRACKS
119	OPJT		0	WITH ROOTS
125	RTS		0	LIGHT ROOTS IN JOINT
126	SVC	09	0	ROOTS THRU CAP
137	SVC	09	144	BREAK IN, FAIR, ROOTS
138	SAG START		0	
161	SVC	03	0	BREAK IN, FAIR, ROOTS
175	SVC	09	0	POOR CAP
177	CRKP START		0	LIGHT CRACK
177	SAG END		0	
179	OPJT		0	
180	SVC	03	0	POOR CAP
183	CRKP END		0	
188	CIRCRK		0	LIGHT CRACK
218	CRKP START		0	LIGHT CRACKS
225	CRKP END		0	
227	SAG START		0	
234	SAG END		0	
238	END TV		0	

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
REED STREET	46	049 A	46	049 B	AC	8	207	207	13	3/25/2013	LIGHT	
<b>Footage</b>												
	000	START TV			0					UPSTREAM MH		
	034	BRKP			288					HOLE IN PIPE, LEAKING		
	035	SVC		03	432					BREAK IN, POOR, LEAKING		
	075	BRKP			288					HOLE IN PIPE, LEAKING		
	076	SVC		12	0					POSSIBLE SERVICE, CAMERA DID NOT PAN		
	077	BRKP			288					HOLE IN PIPE, LEAKING		
	127	SVC		12	0					BREAK IN, PVC, FAIR		
	135	BRKP			144					CRACKED PIPE		
	166	OFSTJT			0					SLIGHT BEND AT JOINT		
	172	PIPECHG			0					AC TO PVC		
	181	SVC		03	0					FACTORY		
	183	PIPECHG			0					PVC TO AC		
	192	SVC		12	432					CAPPED, LEAKING		
	199	SVC		12	144					BREAK IN, FAIR		
	207	END TV			0					DOWNSTREAM MH, PS WET WELL		

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
TOMAHAWK ROAD	47	036	47	033	AC	8	233	233	13	4/26/2017	LIGHT	
<b>Footage</b>												
	000	START TV			0					UPSTREAM SMH 47036		
	066	SVC		09	144					BREAK IN, ACTIVE, INFILTRATION STAIN		
	074	OBST			0					LARGE ROCK IN PIPE, NOT REMOVED IN INSPECTION VIDEO		
	201	CRKP START			0					MODERATE LONGITUDINAL CRACK		
	224	CRKP END			0					CRACK ENDS		
	233	END TV			0					INSPECTION FINISHED, DOWNSTREAM SMH 47033		

Street	Start		End		Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
	Subarea	Manhole	Subarea	Manhole								
TOMAHAWK ROAD	47	037	47	036	AC	8	215	215	13	4/26/2017	LIGHT	
	<b>Footage</b>		<b>Defect Code</b>		<b>Clock Position</b>		<b>Infiltration Rate (gpd)</b>		<b>Defect Comments</b>			
	000	START TV			0				UPSTREAM SMH 47037, LEAKING AT INVERT			
	014	SVC		09	0				BREAK IN, ACTIVE			
	071	SAG START			0				40%			
	091	SAG END			0							
	093	SVC		02	0				BREAK IN, ACTIVE, MODERATE ROOTS IN CONNECTION			
	099	SVC		09	1,440				BREAK IN, ACTIVE, VOID AT CONNECTION			
	103	SVC		09	1,440				BREAK IN, ACTIVE, VOID AT CONNECTION			
	133	BRKP			288				HOLE IN PIPE, SOIL EXPOSED, INFILTRATION STAIN			
	135	CRKP			0				BEGINNING OF STONE PUNCTURE			
	195	SVC		09	0				BREAK IN, ACTIVE, FAIR			
	197	GREASE			0				LIGHT GREASE, CONTINUOUS			
	203	SAG START			0				50%			
	209	SVC		03	0				BREAK IN, ACTIVE, FAIR			
	215	END TV			0				INSPECTION FINISHED, DOWNSTREAM SMH 47036			

Street	Start		End		Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
	Subarea	Manhole	Subarea	Manhole								
ORCHARD PLACE	AM	001	AM	002	VC	8	97	97	3	3/30/2016	LIGHT	
	<b>Footage</b>		<b>Defect Code</b>		<b>Clock Position</b>		<b>Infiltration Rate (gpd)</b>		<b>Defect Comments</b>			
	000	START TV			0				DOWNSTREAM SMH AM001			
	008	CRKP START			0				MULTIPLE MODERATE HINGE CRACKS			
	010	SVC		09	0				FACTORY, ACTIVE			
	055	CIRCRK			0				LIGHT CRACK IN JOINT			
	055	LKJT			432				ACTIVELY LEAKING			
	064	CIRCRK			720				LIGHT CRACK IN JOINT			
	094	CIRCRK			0				LIGHT CRACKS			
	097	END TV			0				INSPECTION FINISHED, UPSTREAM SMH AM002			



Street	Start		End		Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
	Subarea	Manhole	Subarea	Manhole								
ORCHARD PLACE	AM	001	M4	198	VC	8	242	242	3	3/30/2016	NONE	
	<b>Footage</b>											
	000	START TV			0					UPSTREAM SMH AM001		
	004	LKJT			1,008					ACTIVELY LEAKING		
	060	SVC		03	0					FACTORY, ACTIVE		
	104	CIRCRK			0					HAIRLINE CRACK IN JOINT		
	104	RTS			0					FINE ROOTS IN JOINT		
	106	RTS			0					LIGHT ROOTS IN JOINT		
	111	SVC		03	0					FACTORY, ACTIVE		
	122	CRKP			0					LIGHT CRACK IN JOINT		
	127	CIRCRK			0					HAIRLINE CRACK IN JOINT		
	147	SVC		03	0					FACTORY, CAPPED, MODERATE ROOTS IN CAP		
	149	RTS			0					FINE ROOTS IN JOINT		
	172	PROTSVC		03	0					BREAK IN, ACTIVE, FAIR, PROTRUDING 2-INCHES		
	220	BRKP			0					MODERATE BREAK IN JOINT, MULTIPLE FRACTURES		
	242	END TV			0					INSPECTION FINISHED, DOWNSTREAM SMH M4198		
ORCHARD PLACE	<b>Footage</b>											
	AM	002	AM	003	VC	8	158	158	3	3/30/2016	NONE	
	<b>Footage</b>											
	000	START TV			0					DOWNSTREAM SMH AM002		
	002	CIRCRK			0					LIGHT CRACKS AT MANHOLE		
	068	RTS			0					LIGHT ROOTS IN JOINT		
	072	SVC		09	0					FACTORY, ACTIVE, MODERATE ROOTS IN SERVICE		
	073	RTS			0					LIGHT ROOTS IN JOINT		
	076	RTS			0					LIGHT ROOTS IN JOINT		
	158	END TV			0					INSPECTION FINISHED, UPSTREAM SMH AM003		

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
BIKE PATH EASEMENT	BA	003	M2	005	NO TV	18	37	0		1/10/2006	NONE	
<b>Footage Defect Code Clock Position Infiltration Rate (gpd) Defect Comments</b>												
	000	NONE			0					NO TV		
Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
BIKE PATH EASEMENT	BA	005	BA	003	NO TV	18	100	0		1/10/2006	LIGHT	
<b>Footage Defect Code Clock Position Infiltration Rate (gpd) Defect Comments</b>												
	000	NONE			0					NO TV		
Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
BIKE PATH EASEMENT	BA	006	BA	005	VC	18	90	90	3	1/10/2006	LIGHT	
<b>Footage Defect Code Clock Position Infiltration Rate (gpd) Defect Comments</b>												
	000	NONE			0					START INSPECTION AT UPSTREAM MH		
	090	NONE			0					END INSPECTION AT DOWNSTREAM MH		
Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
BIKE PATH EASEMENT	BA	007	BA	006	VC	18	144	144	3	1/10/2006	LIGHT	
<b>Footage Defect Code Clock Position Infiltration Rate (gpd) Defect Comments</b>												
	000	NONE			0					START INSPECTION AT UPSTREAM MH		
	006	SVC	12		0					CAPPED		
	007	LKJT			1,152					LEAKING JOINT		
	009	SVC	12		0					CAPPED		
	012	SVC	12		0					CAPPED		
	013	OPJT			288					OPEN JOINT		
	014	SVC	12		0					CAPPED		
	017	SVC	12		0					CAPPED		
	019	LKJT			1,152					METAL ROD STUCK IN JOINT		
	020	SVC	12		0					CAPPED		

021	LKJT		720		LEAKING JOINT
023	SVC	12	0		CAPPED
026	SVC	12	0		CAPPED
029	SVC	12	0		CAPPED
032	SVC	12	0		CAPPED
034	SVC	12	0		CAPPED
036	LKJT		576		LEAKING JOINT
037	SVC	12	0		CAPPED
040	SVC	12	0		CAPPED
043	SVC	12	0		CAPPED
046	SVC	12	0		CAPPED
049	SVC	12	0		CAPPED
050	BRKP		0		1" HOLE IN PIPE
052	SVC	12	0		CAPPED
055	SVC	12	0		CAPPED
058	SVC	12	0		CAPPED
060	SVC	12	0		CAPPED
063	SVC	12	0		CAPPED
066	SVC	12	0		CAPPED
069	SVC	12	0		CAPPED
072	SVC	12	0		CAPPED
075	SVC	12	0		CAPPED
078	SVC	12	0		CAPPED
078	SVC	12	0		CAPPED
080	SVC	12	0		CAPPED
083	SVC	12	0		CAPPED
085	SVC	12	432		CAPPED WITH ROOTS
087	SVC	12	0		CAPPED
090	SVC	12	0		CAPPED
093	SVC	12	0		CAPPED
096	SVC	12	0		CAPPED
097	LKJT		288		LEAKING JOINT
098	SVC	12	0		CAPPED





118	MNLDEP	0							SIGNS OF INFILTRATION	
140	SAG START	0							1" SAG	
144	PIPE RPR STAR	12	0						POINT REPAIR APPEARS FAIR	
144	SVC	03	0							
146	SVC	09	0						CAPPED	
154	CRKP START	12	0						SOIL VISIBLE	
156	SVC	09	432						BREAK IN CONNECTION	
157	CRKP END	12	0							
165	LKJT	09	432							
170	OFSTJT		0							
178	SVC	03	432							
181	SVC	09	0						CAPPED	
205	MNLDEP		0						SIGNS OF INFILTRATION ON JOINT	
211	SVC	03	0						CAPPED	
212	CRKP	03	0						LIGHT CRACKS AROUND SVC	
212	SVC	03	144						BREAK IN CONNECTION	
216	MNLDEP		0						SIGNS OF INFILTRATION ON JOINT	
219	MNLDEP		0						SIGNS OF INFILTRATION ON JOINT	
222	MNLDEP		0						SIGNS OF INFILTRATION ON JOINT	
225	MNLDEP		0						SIGNS OF INFILTRATION ON JOINT	
230	LKJT		288						INFILTRATION IN JOINT	
233	MNLDEP		0						SIGNS OF INFILTRATION ON JOINT	
245	SAG START		0						1" SAG	
249	SAG END		0							
255	NONE		0						END INSPECTION AT DOWNSTREAM MH	

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
BIKE PATH ESMT	BA	011	BA	008	VC	18	48	48	3	1/10/2006	LIGHT	
<b>Footage</b>												
	000	NONE			0					START INSPECTION AT UPSTREAM MH		
	016	MULTCRKS		06	720					CRACK AT JOINT		
	048	NONE			0					END INSPECTION AT DOWNSTREAM MH		

Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
BIKE PATH EASEMENT	BA	012	BA	011	VC	18	146	146	3	1/10/2006	LIGHT	
<b>Footage</b>												
		Defect Code		Clock Position	Infiltration Rate (gpd)	Defect Comments						
	000	NONE			0	START INSPECTION AT UPSTREAM MH						
	005	BRKP			576	BROKEN PIPE, LEAKING						
	092	LKJT			144	CRACKED JOINT						
	133	LKJT			144							
	146	NONE			0	END INSPECTION AT DOWNSTREAM MH						
Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
BIKE PATH EASEMENT	BA	013	BA	012	VC	18	139	139	3	1/10/2006	LIGHT	
<b>Footage</b>												
	000	NONE			0	START INSPECTION AT UPSTREAM MH						
	004	LKJT			0	JOINT WEEPING						
	011	CRKP			0	PIPE SCALING						
	020	CRKP			432	CRACK						
	139	NONE			0	END INSPECTION AT DOWNSTREAM MH						
Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
BIKE PATH EASEMENT	BA	014	BA	013	VC	18	104	104	3	1/10/2006	LIGHT	
<b>Footage</b>												
	000	NONE			0	START INSPECTION AT UPSTREAM MH						
	104	NONE			0	END INSPECTION AT DOWNSTREAM MH						
Street	Start Subarea	Start Manhole	End Subarea	End Manhole	Pipe Material	Pipe Diameter (in)	Pipe Length (ft)	TV Pipe Length (ft)	Joint Spacing (ft)	Date Inspected	Debris Estimated	Debris Type
BIKE PATH EASEMENT	BA	015	BA	014	VC	18	39	39	3	1/10/2006	LIGHT	
<b>Footage</b>												
	000	NONE			0	START INSPECTION AT UPSTREAM MH						
	039	NONE			0	END INSPECTION AT DOWNSTREAM MH						

Street	Start	Start	End	End	Pipe	Pipe	Pipe	Pipe	TV Pipe	Joint	Date	Debris
	Subarea	Manhole	Subarea	Manhole	Material	Diameter (in)	Length (ft)	Length (ft)	Length (ft)	Spacing (ft)	Inspected	Estimated
BIKE PATH EASEMENT	BA	016	BA	015	VC	18	141	141	141	3	1/10/2006	LIGHT
	Footage											
	000	NONE										
	001	LKJT										
	054	MNLDEP										
141	NONE											
Defect Comments												
START INSPECTION AT UPSTREAM MH												
INVERT CONNECTION LEAKING												
MINERAL DEPOSITS IN JOINT												
END INSPECTION AT DOWNSTREAM MH												



## MANHOLE INSPECTION REPORTS

X Coordinate:

752892.787

**MANHOLE INSPECTION REPORT**

Y Coordinate:

2970897.116

Project: Area # 1Date: 4/11/2005Street: FAIRMONT STREET Subarea: 07 Manhole #: 7 Manhole Suffix: \_\_\_\_\_Inspector: JB Manhole Inspection Status: YES Weather: \_\_\_\_\_Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONE

Drainage Area (sqft): \_\_\_\_\_

**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	288.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 6

Notes

Surcharge Evidence: ☐ YesManhole Steps: YESManhole Cleaning Required: LIGHT**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

<u>PIPE DATA</u>	<u>OUT TO</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>
Sub Area:	BA	07	07		
Manhole #:	6	2	SVC		
Suffix:					
Diameter (in):	12	12	4		
Depth, Rim to Invert (ft):	6	6	5		
Type of Pipe:	VC	VC	VC		

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 7Date: 3/20/2013Street: HIGHLAND AVENUE Subarea: 12 Manhole #: 25 Manhole Suffix: Inspector: CP Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	FAIR		FAIR
Frame	CAST IRON	FAIR	0.00	FAIR
Riser	BRICK	NEEDS REPAIR	576.00	NEEDS REPAIR
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	NEEDS REPAIR	576.00	NEEDS REPAIR
Walls	BRICK	NEEDS REPAIR	720.00	NEEDS REPAIR
Bench	BRICK	FAIR	0.00	FAIR
Invert	BRICK	FAIR	0.00	FAIR

Manhole Depth (ft): 7.4

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 7Date: 3/20/2013Street: HIGHLAND AVENUE Subarea: 12 Manhole #: 26 Manhole Suffix: Inspector: CP Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	FAIR		FAIR
Frame	CAST IRON	FAIR	0.00	FAIR
Riser	BRICK	NEEDS REPAIR	576.00	NEEDS REPAIR
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	FAIR	0.00	FAIR
Walls	BRICK	FAIR	0.00	FAIR
Bench	BRICK	FAIR	0.00	FAIR
Invert	BRICK	FAIR	0.00	FAIR

Manhole Depth (ft): 5.3

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 7Date: 3/20/2013Street: HIGHLAND AVENUE Subarea: 12 Manhole #: 27 Manhole Suffix: Inspector: CP Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: BELOW GRAD Cover Inflow: PONDINGDrainage Area (sqft): 16**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	FAIR		FAIR
Frame	CAST IRON	FAIR	0.00	FAIR
Riser	BRICK	NEEDS REPAIR	288.00	NEEDS REPAIR
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	NEEDS REPAIR	288.00	NEEDS REPAIR
Walls	BRICK	NEEDS REPAIR	576.00	NEEDS REPAIR
Bench	BRICK	FAIR	0.00	FAIR
Invert	BRICK	FAIR	0.00	FAIR

Manhole Depth (ft): 7.4

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 7Date: 3/20/2013Street: HIGHLAND AVENUE Subarea: 12 Manhole #: 28 Manhole Suffix: Inspector: CP Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	FAIR		FAIR
Frame	CAST IRON	FAIR	0.00	FAIR
Riser	BRICK	NEEDS REPAIR	720.00	NEEDS REPAIR
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	NEEDS REPAIR	432.00	NEEDS REPAIR
Walls	BRICK	NEEDS REPAIR	288.00	NEEDS REPAIR
Bench	BRICK	FAIR	0.00	FAIR
Invert	BRICK	FAIR	0.00	FAIR

Manhole Depth (ft): 7.2

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 7Date: 3/20/2013Street: HIGHLAND AVENUE Subarea: 12 Manhole #: 29 Manhole Suffix: AInspector: CP Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	FAIR		FAIR
Frame	CAST IRON	FAIR	0.00	FAIR
Riser	BRICK	FAIR	0.00	FAIR
Steps				
Corbel	BRICK	FAIR	0.00	FAIR
Walls	BRICK	FAIR	0.00	FAIR
Bench	BRICK	FAIR	0.00	FAIR
Invert	BRICK	FAIR	0.00	FAIR

Manhole Depth (ft): 3.2

Notes Summit manhole.

Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: YES**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 7Date: 3/20/2013Street: HIGHLAND AVENUE Subarea: 12 Manhole #: 29 Manhole Suffix: Inspector: CP Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: SHEET FLOWDrainage Area (sqft): 300**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	FAIR		FAIR
Frame	CAST IRON	FAIR	0.00	FAIR
Riser	BRICK	NEEDS REPAIR	1440.00	NEEDS REPAIR
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	NEEDS REPAIR	720.00	NEEDS REPAIR
Walls	BRICK	NEEDS REPAIR	720.00	NEEDS REPAIR
Bench	BRICK	FAIR	0.00	FAIR
Invert	BRICK	FAIR	0.00	FAIR

Manhole Depth (ft): 6.5

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>



X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 8Date: 2/24/2014Street: HIGH HAITH ROAD Subarea: 12 Manhole #: 43 Manhole Suffix: Inspector: Patrick Yeo Manhole Inspection Status: YES Weather: Located:  Surface:  Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 8.1

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/9/2016Street: GRAY STREET Subarea: 18 Manhole #: 21 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	LINED	OK	0.00	OK
Steps		OK		OK
Corbel	LINED	OK	0.00	OK
Walls	LINED	OK	0.00	OK
Bench	LINED	FAIR	144.00	FAIR
Invert	LINED	FAIR	144.00	FAIR

Manhole Depth (ft): 8.3

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/9/2016Street: FOUNTAIN ROAD Subarea: 18 Manhole #: 22 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 5.2

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

<u>PIPE DATA</u>	<u>OUT TO</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/9/2016Street: FOUNTAIN ROAD Subarea: 18 Manhole #: 23 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	FAIR	0.00	FAIR
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 5.3

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/9/2016Street: FOUNTAIN ROAD Subarea: 18 Manhole #: 25 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 5.7

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/9/2016Street: FOUNTAIN ROAD Subarea: 18 Manhole #: 26 Manhole Suffix: \_\_\_\_\_Inspector: SEPHERA MI Manhole Inspection Status: LAMP HOLE Weather: \_\_\_\_\_Located: STREET Surface: \_\_\_\_\_ Manhole Type: \_\_\_\_\_Manhole Grade: \_\_\_\_\_ Cover Inflow: NONE

Drainage Area (sqft): \_\_\_\_\_

**MANHOLE CONDITION & DIMENSION DATA**

Cover Diameter (in): \_\_\_\_\_

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover				
Frame			0.00	
Riser			0.00	
Steps				
Corbel			0.00	
Walls			0.00	
Bench			0.00	
Invert			0.00	

Manhole Depth (ft): \_\_\_\_\_

Surcharge Evidence:  No

Manhole Steps: \_\_\_\_\_

Manhole Cleaning Required: \_\_\_\_\_

Notes

TV INSPECTION OBSERVED  
LAMP HOLE AT 18026**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: QUINCY STREET Subarea: 19 Manhole #: 4 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: SHEET FLOWDrainage Area (sqft): 40**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 7.9Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO

Notes Shared storm drain photo number 489.

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: QUINCY STREET Subarea: 19 Manhole #: 5 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: SHEET FLOWDrainage Area (sqft): 40**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps				
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 6.4Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: NO

Notes

Shared storm drain photo number 494.

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>



X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: QUINCY STREET Subarea: 19 Manhole #: 6 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps				
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 7Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: NO

Notes

Shared storm drain photo number 499.

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: QUINCY STREET Subarea: 19 Manhole #: 7 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps				
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	FAIR	432.00	FAIR
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 6.8Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: NO

Notes

Shared storm drain photo number 504.

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: QUINCY STREET Subarea: 19 Manhole #: 8 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps				
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	144.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 6.5Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: NO

Notes

Shared storm drain photo number 509.

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: QUINCY STREET Subarea: 19 Manhole #: 9 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps				
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	FAIR	0.00	FAIR
Bench	BRICK	FAIR	720.00	FAIR
Invert	BRICK	FAIR	720.00	FAIR

Manhole Depth (ft): 5.6Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: NO

Notes Shared storm drain photo number 514.

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: QUINCY STREET Subarea: 19 Manhole #: 10 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: SHEET FLOWDrainage Area (sqft): 40**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	FAIR	144.00	FAIR
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	NEEDS REPAIR	576.00	NEEDS REPAIR
Bench	BRICK	NEEDS REPAIR	1440.00	NEEDS REPAIR
Invert	BRICK	NEEDS REPAIR	1440.00	NEEDS REPAIR

Manhole Depth (ft): 7.8

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/11/2016Street: BENJAMIN ROAD Subarea: 19 Manhole #: 16 Manhole Suffix: \_\_\_\_\_Inspector: \_\_\_\_\_ Manhole Inspection Status: LAMP HOLE Weather: \_\_\_\_\_

Located: \_\_\_\_\_ Surface: \_\_\_\_\_ Manhole Type: \_\_\_\_\_

Manhole Grade: \_\_\_\_\_ Cover Inflow: NONE

Drainage Area (sqft): \_\_\_\_\_

**MANHOLE CONDITION & DIMENSION DATA**

Cover Diameter (in): \_\_\_\_\_

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Frame	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Riser	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Steps	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Corbel	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Walls	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Bench	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Invert	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>

Manhole Depth (ft): \_\_\_\_\_

Notes

Surcharge Evidence:  No

Manhole Steps: \_\_\_\_\_

Manhole Cleaning Required: \_\_\_\_\_

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: LEHIGH STREET Subarea: 19 Manhole #: 17 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: LAMP HOLE Weather: Located: STREET Surface:  Manhole Type: Manhole Grade:  Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover				
Frame			0.00	
Riser			0.00	
Steps				
Corbel			0.00	
Walls			1152.00	
Bench			0.00	
Invert			0.00	

Manhole Depth (ft): Surcharge Evidence:  NoManhole Steps: Manhole Cleaning Required: 

Notes

LAMP HOLE INFILTRATION  
OBSERVED IN TV  
INSPECTION**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: LEHIGH STREET Subarea: 19 Manhole #: 18 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: PONDINGDrainage Area (sqft): 40**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR
Steps				
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 4.9

Notes

Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>



X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/11/2016Street: BENJAMIN ROAD Subarea: 19 Manhole #: 19 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	FAIR	432.00	FAIR
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 7

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: YES**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/11/2016Street: BENJAMIN ROAD Subarea: 19 Manhole #: 20 Manhole Suffix: \_\_\_\_\_Inspector: SEPHERA MI Manhole Inspection Status: LAMP HOLE Weather: \_\_\_\_\_Located: STREET Surface: \_\_\_\_\_ Manhole Type: \_\_\_\_\_Manhole Grade: \_\_\_\_\_ Cover Inflow: NONE

Drainage Area (sqft): \_\_\_\_\_

**MANHOLE CONDITION & DIMENSION DATA**

Cover Diameter (in): \_\_\_\_\_

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Frame	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Riser	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Steps	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Corbel	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Walls	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Bench	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Invert	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>

Manhole Depth (ft): \_\_\_\_\_

Notes

Surcharge Evidence:  No

Manhole Steps: \_\_\_\_\_

Manhole Cleaning Required: \_\_\_\_\_

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/8/2016Street: NORTH UNION STREET Subarea: 32 Manhole #: 1 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	CONCRETE	NEEDS REPAIR	0.00	NEEDS REPAIR
Invert	CONCRETE	NEEDS REPAIR	0.00	NEEDS REPAIR

Manhole Depth (ft): 7.1

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/8/2016Street: NORTH UNION STREET Subarea: 32 Manhole #: 2 Manhole Suffix: AInspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	FAIR	0.00	FAIR
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 5.9

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/8/2016Street: NORTH UNION STREET Subarea: 32 Manhole #: 2 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	CONCRETE	FAIR	288.00	FAIR
Invert	CONCRETE	FAIR	288.00	FAIR

Manhole Depth (ft): 5.8

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/8/2016Street: NORTH UNION STREET Subarea: 32 Manhole #: 3 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	CONCRETE	FAIR	0.00	FAIR
Invert	CONCRETE	FAIR	0.00	FAIR

Manhole Depth (ft): 5.6

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/8/2016Street: WHEATON ROAD Subarea: 32 Manhole #: 3 Manhole Suffix: AInspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	FAIR	0.00	FAIR
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK		0.00	
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 5.8

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/8/2016Street: NORTH UNION STREET Subarea: 32 Manhole #: 4 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR
Invert	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR

Manhole Depth (ft): 7.8

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>



X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/8/2016Street: GORDON ROAD Subarea: 32 Manhole #: 12 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: DIRT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps				
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	288.00	OK
Bench			0.00	
Invert			0.00	

Manhole Depth (ft): 4.6

Notes

Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/9/2016Street: FREMONT COURT Subarea: 32 Manhole #: 14 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: EASEMENT Surface: GRASS Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 9

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/8/2016Street: NORTH UNION STREET Subarea: 32 Manhole #: 302 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	FAIR	432.00	FAIR
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 6.5

Notes

Surcharge Evidence: ☐ YesManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: MILL STREET Subarea: 37 Manhole #: 11 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 7.8

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/11/2016Street: CUTTER HILL ROAD Subarea: 37 Manhole #: 22 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: PONDINGDrainage Area (sqft): 200**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	REPLACE	0.00	REPLACE
Riser	BRICK	OK	0.00	OK
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 8.2

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: MILL STREET Subarea: 37 Manhole #: 23 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 6.7Notes **SURCHARGED**Surcharge Evidence: ☐ YesManhole Steps: YESManhole Cleaning Required: YES**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: MILL STREET Subarea: 37 Manhole #: 24 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 7.6Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NONotes  
Stubs at 9 & 3 o'clock appear abandoned.**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/10/2016Street: MILL STREET Subarea: 37 Manhole #: 301 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 6.2

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>



X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 6Date: 3/22/2011Street: OLD COLONY ROAD Subarea: 41 Manhole #: 5 Manhole Suffix: Inspector: JA Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES</u>	<u>NOTES</u>
Cover	CAST IRON	OK		OK	
Frame	CAST IRON	OK	0.00	OK	
Riser	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR	
Steps		OK		OK	
Corbel	BRICK	OK	0.00	OK	
Walls	BRICK	OK	0.00	OK	
Bench	BRICK	OK	0.00	OK	
Invert	BRICK	OK	0.00	OK	

Manhole Depth (ft): 6.7

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: LIGHT**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	41	41	41		
Manhole #:	4	006	PVT		
Suffix:					
Diameter (in):	8	8	8		
Depth, Rim to Invert (ft):	6.7	6.3	6.1		
Type of Pipe:	VC	VC	PVC		

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 6Date: 3/22/2011Street: OLD COLONY ROAD Subarea: 41 Manhole #: 6 Manhole Suffix: Inspector: JA Manhole Inspection Status: BURIED Weather: Located: STREET Surface: ASPHALT Manhole Type: Manhole Grade: BELOW GRAD Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Frame	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Riser	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Steps	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Corbel	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Walls	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Bench	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Invert	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>

Manhole Depth (ft): 

Notes

Surcharge Evidence:  NoManhole Steps: Manhole Cleaning Required: **SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/> 41	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/> 5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 6Date: 3/22/2011Street: OLD COLONY ROAD Subarea: 41 Manhole #: 11 Manhole Suffix: Inspector: JA Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR
Invert	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR

Manhole Depth (ft): 5.9

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NONE**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	41	41			
Manhole #:	12	010			
Suffix:					
Diameter (in):	8	8			
Depth, Rim to Invert (ft):	5.9	5.8			
Type of Pipe:	VC	VC			

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 6Date: 3/22/2011Street: OLD COLONY ROAD Subarea: 41 Manhole #: 12 Manhole Suffix: Inspector: JA Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR
Invert	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR

Manhole Depth (ft): 6

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: LIGHT**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	41	41			
Manhole #:	305	011			
Suffix:					
Diameter (in):	8	8			
Depth, Rim to Invert (ft):	6	6			
Type of Pipe:	VC	VC			

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 6Date: 3/22/2011Street: OLD COLONY ROAD Subarea: 41 Manhole #: 13 Manhole Suffix: Inspector: JA Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 6.6

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: LIGHT**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	41	41			
Manhole #:	14	305			
Suffix:					
Diameter (in):	8	8			
Depth, Rim to Invert (ft):	6.6	6.6			
Type of Pipe:	VC	VC			

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 6Date: 3/22/2011Street: OLD COLONY ROAD Subarea: 41 Manhole #: 14 Manhole Suffix: Inspector: JA Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 6.4

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: LIGHT**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

<u>PIPE DATA</u>	<u>OUT TO</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>
Sub Area:	41	41			
Manhole #:	15	013			
Suffix:					
Diameter (in):	8	8			
Depth, Rim to Invert (ft):	6.4	6.3			
Type of Pipe:	VC	VC			

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 6Date: 3/22/2011Street: WINDMILL LANE Subarea: 41 Manhole #: 15 Manhole Suffix: Inspector: JA Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR
Walls	BRICK	OK	0.00	OK
Bench	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR
Invert	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR

Manhole Depth (ft): 6.9

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NONE**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	41	41	41		
Manhole #:	19	016	014		
Suffix:					
Diameter (in):	8	8	8		
Depth, Rim to Invert (ft):	6.9	6.9	6.2		
Type of Pipe:	VC	VC	VC		

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 6Date: 3/22/2011Street: WINDMILL LANE Subarea: 41 Manhole #: 19 Manhole Suffix: Inspector: JA Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	NEEDS REPAIR	0.00	NEEDS REPAIR
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 7.9

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NONE**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	41	41	41		
Manhole #:	30	015	SC		
Suffix:					
Diameter (in):	8	8	6		
Depth, Rim to Invert (ft):	7.9	7.9	7.7		
Type of Pipe:	VC	VC	VC		



X Coordinate:

746193.066

**MANHOLE INSPECTION REPORT**

Y Coordinate:

2983008.782

Project: Area # 2Date: 3/30/2006Street: FOX MEADOW LANE Subarea: 44 Manhole #: 30 Manhole Suffix: \_\_\_\_\_Inspector: JB Manhole Inspection Status: YES Weather: \_\_\_\_\_Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): 300**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 7

Notes

Surcharge Evidence: ☐ NoManhole Steps: YESManhole Cleaning Required: NONE**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

<u>PIPE DATA</u>	<u>OUT TO</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>
Sub Area:	44	44			
Manhole #:	25	031			
Suffix:					
Diameter (in):	8	8			
Depth, Rim to Invert (ft):	7	7			
Type of Pipe:	VC	VC			

X Coordinate:

746197.218

**MANHOLE INSPECTION REPORT**

Y Coordinate:

2983000.053

Project: Area # 2Date: 3/30/2006Street: FOX MEADOW LANE Subarea: 44 Manhole #: 31 Manhole Suffix: \_\_\_\_\_Inspector: JB Manhole Inspection Status: YES Weather: \_\_\_\_\_Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): 175**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES</u>	<u>NOTES</u>
Cover	CAST IRON	OK		OK	
Frame	CAST IRON	OK	0.00	OK	
Riser	BRICK	OK	0.00	OK	
Steps		OK		OK	
Corbel	BRICK	OK	0.00	OK	
Walls	BRICK	OK	0.00	OK	
Bench	BRICK	OK	0.00	OK	
Invert	BRICK	OK	0.00	OK	

Manhole Depth (ft): 6

Notes

Surcharge Evidence: ☐ YesManhole Steps: YESManhole Cleaning Required: MEDIUM**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

<u>PIPE DATA</u>	<u>OUT TO</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>
Sub Area:	44	NONE	NONE		
Manhole #:	30	SVC	SVC		
Suffix:					
Diameter (in):	8	6	6		
Depth, Rim to Invert (ft):	6	7	6		
Type of Pipe:	VC	VC	VC		

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 7Date: 3/15/2013Street: REED STREET Subarea: 46 Manhole #: 46 Manhole Suffix: AInspector: CP Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	PRECAST	OK	0.00	OK
Walls	PRECAST	OK	288.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 5

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 7Date: 3/20/2013Street: REED STREET Subarea: 46 Manhole #: 46 Manhole Suffix: \_\_\_\_\_Inspector: CP Manhole Inspection Status: CNL Weather: \_\_\_\_\_Located: STREET Surface: \_\_\_\_\_ Manhole Type: \_\_\_\_\_

Manhole Grade: \_\_\_\_\_ Cover Inflow: \_\_\_\_\_

Drainage Area (sqft): \_\_\_\_\_

**MANHOLE CONDITION & DIMENSION DATA**

Cover Diameter (in): \_\_\_\_\_

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Frame	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Riser	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Steps	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Corbel	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Walls	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Bench	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Invert	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>

Manhole Depth (ft): \_\_\_\_\_

Notes

Surcharge Evidence:  No

Manhole Steps: \_\_\_\_\_

Manhole Cleaning Required: \_\_\_\_\_

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 7Date: 3/15/2013Street: REED STREET Subarea: 46 Manhole #: 49 Manhole Suffix: AInspector: CP Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	FAIR		FAIR
Frame	CAST IRON	FAIR	0.00	FAIR
Riser	BRICK	OK	0.00	OK
Steps				
Corbel	PRECAST	FAIR	144.00	FAIR
Walls	PRECAST	NEEDS REPAIR	2880.00	NEEDS REPAIR
Bench			0.00	
Invert			0.00	

Manhole Depth (ft): 11.4Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: 

Notes

Manhole connected to pump station. Walls leaking at seam, needs to be lined.

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 11Date: 3/31/2017Street: REED STREET Subarea: 46 Manhole #: 49 Manhole Suffix: BInspector: Jamie Craig Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	PRECAST	OK	0.00	OK
Walls	PRECAST	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 11.6Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: YES

Notes Moderate mineral deposits in all pipe connections

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 7Date: 3/15/2013Street: REED STREET Subarea: 46 Manhole #: 49 Manhole Suffix: Inspector: CP Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	FAIR	0.00	FAIR
Riser	BRICK	FAIR	0.00	FAIR
Steps		NEEDS REPAIR		NEEDS REPAIR
Corbel	BRICK	FAIR	0.00	FAIR
Walls	BRICK	NEEDS REPAIR	720.00	NEEDS REPAIR
Bench			0.00	
Invert			0.00	

Manhole Depth (ft): 6.1Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO

Notes Mineral deposits on downstream pipe connection. Leaking at both pipe connections, bench/wall.

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

909484.4

**MANHOLE INSPECTION REPORT**

Y Coordinate:

226964.2

Project: Area # 4Date: 4/8/2008Street: LAWRENCE LANE Subarea: 47 Manhole #: 33 Manhole Suffix: \_\_\_\_\_Inspector: EH Manhole Inspection Status: YES Weather: \_\_\_\_\_Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: \_\_\_\_\_Drainage Area (sqft): 200**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES</u>	<u>NOTES</u>
Cover	CAST IRON	OK		OK	
Frame	CAST IRON	OK	0.00	OK	
Riser	BRICK	OK	0.00	OK	
Steps		OK		OK	
Corbel	BRICK	OK	0.00	OK	
Walls	BRICK	OK	288.00	OK	
Bench	BRICK	OK	0.00	OK	
Invert	BRICK	OK	0.00	OK	

Manhole Depth (ft): 8.5

Notes

Surcharge Evidence: ☐ NoManhole Steps: YESManhole Cleaning Required: LIGHT**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	47	47	47		
Manhole #:	30	34			
Suffix:					
Diameter (in):	8	8	8		
Depth, Rim to Invert (ft):	8.5	8.5	8.5		
Type of Pipe:	VC	VC	VC		



X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 11Date: 3/23/2017Street: TOMAHAWK ROAD Subarea: 47 Manhole #: 36 Manhole Suffix: Inspector: Jamie Craig Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	FAIR	0.00	FAIR
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	144.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 5.9

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: YES**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 11Date: 3/23/2017Street: TOMAHAWK ROAD Subarea: 47 Manhole #: 37 Manhole Suffix: Inspector: Jamie Craig Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	FAIR	0.00	FAIR
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	FAIR	0.00	FAIR
Invert	BRICK	FAIR	0.00	FAIR

Manhole Depth (ft): 7.7

Notes

Surcharge Evidence: ☐ YesManhole Steps: YESManhole Cleaning Required: YES**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 6Date: 3/24/2011Street: WINCHESTER ROAD Subarea: 50 Manhole #: 251 Manhole Suffix: Inspector: JA Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		N/A		N/A
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	864.00	OK
Bench	BRICK	OK	864.00	OK
Invert	BRICK	OK	864.00	OK

Manhole Depth (ft): 8.1

Notes

Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: NONE**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

<u>PIPE DATA</u>	<u>OUT TO</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>
Sub Area:	50	50			
Manhole #:	250	252			
Suffix:					
Diameter (in):	8	8			
Depth, Rim to Invert (ft):	8.1	7.9			
Type of Pipe:	AC	AC			

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/11/2016Street: ORCHARD PLACE Subarea: AM Manhole #: 1 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: SHEET FLOWDrainage Area (sqft): 30**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps				
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 7.4

Notes

Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/11/2016Street: ORCHARD PLACE Subarea: AM Manhole #: 2 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps				
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	BRICK	OK	0.00	OK
Invert	BRICK	OK	0.00	OK

Manhole Depth (ft): 7.1

Notes

Surcharge Evidence:  NoManhole Steps: NOManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 10Date: 3/11/2016Street: ORCHARD PLACE Subarea: AM Manhole #: 3 Manhole Suffix: Inspector: SEPHERA MI Manhole Inspection Status: YES Weather: Located: STREET Surface: ASPHALT Manhole Type: STANDARDManhole Grade: AT GRADE Cover Inflow: NONEDrainage Area (sqft): **MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 26

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	CAST IRON	OK		OK
Frame	CAST IRON	OK	0.00	OK
Riser	BRICK	OK	0.00	OK
Steps		OK		OK
Corbel	BRICK	OK	0.00	OK
Walls	BRICK	OK	0.00	OK
Bench	CONCRETE	OK	0.00	OK
Invert	CONCRETE	OK	0.00	OK

Manhole Depth (ft): 6

Notes

Surcharge Evidence:  NoManhole Steps: YESManhole Cleaning Required: NO**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

<u>PIPE DATA</u>	<u>OUT TO</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

**MANHOLE INSPECTION REPORT**

Y Coordinate:

Project: Area # 1Date: 4/12/2005Street: BIKE PATH EASEMENT Subarea: BA Manhole #: 5 Manhole Suffix: \_\_\_\_\_Inspector: JRH Manhole Inspection Status: BURIED Weather: \_\_\_\_\_Located: EASEMENT Surface: DIRT Manhole Type: \_\_\_\_\_Manhole Grade: BELOW GRAD Cover Inflow: NONE

Drainage Area (sqft): \_\_\_\_\_

**MANHOLE CONDITION & DIMENSION DATA**

Cover Diameter (in): \_\_\_\_\_

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Frame	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Riser	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Steps	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Corbel	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Walls	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Bench	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>
Invert	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>

Manhole Depth (ft): \_\_\_\_\_

Notes

Surcharge Evidence:  No

Manhole Steps: \_\_\_\_\_

Manhole Cleaning Required: \_\_\_\_\_

**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

AC - Asbestos

PIPE DATA	OUT TO	IN FROM	IN FROM	IN FROM	IN FROM
Sub Area:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manhole #:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Suffix:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diameter (in):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Depth, Rim to Invert (ft):	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type of Pipe:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

X Coordinate:

752467.711

**MANHOLE INSPECTION REPORT**

Y Coordinate:

2970881.874

Project: Area # 1Date: 4/18/2005Street: THORNDIKE STREET Subarea: BA Manhole #: 9 Manhole Suffix: \_\_\_\_\_Inspector: JB Manhole Inspection Status: YES Weather: \_\_\_\_\_Located: STREET Surface: ASPHALT Manhole Type: OTHERManhole Grade: AT GRADE Cover Inflow: NONE

Drainage Area (sqft): \_\_\_\_\_

**MANHOLE CONDITION & DIMENSION DATA**Cover Diameter (in): 24"

	<u>MATERIAL</u>	<u>CONDITION</u>	<u>GPM</u>	<u>DEFICIENCIES NOTES</u>
Cover	OTHER	OK		OK
Frame	OTHER	OK	0.00	OK
Riser	NONE	OK	0.00	OK
Steps		N/A		N/A
Corbel	NONE	OK	0.00	OK
Walls	NONE	OK	0.00	OK
Bench	NONE	OK	0.00	OK
Invert	NONE	OK	0.00	OK

Manhole Depth (ft): 8

Notes

Surcharge Evidence: ☐ NoManhole Steps: NOManhole Cleaning Required: LIGHT**SEWER PIPE DATA****ABBREVIATIONS:**

VC - Vitrified Clay

PVC - Polyvinyl Chloride

DI - Ductile Iron

CIPP - Cured-in-place

RC - Reinforced Concrete

CI - Cast Iron

BRK - Brick

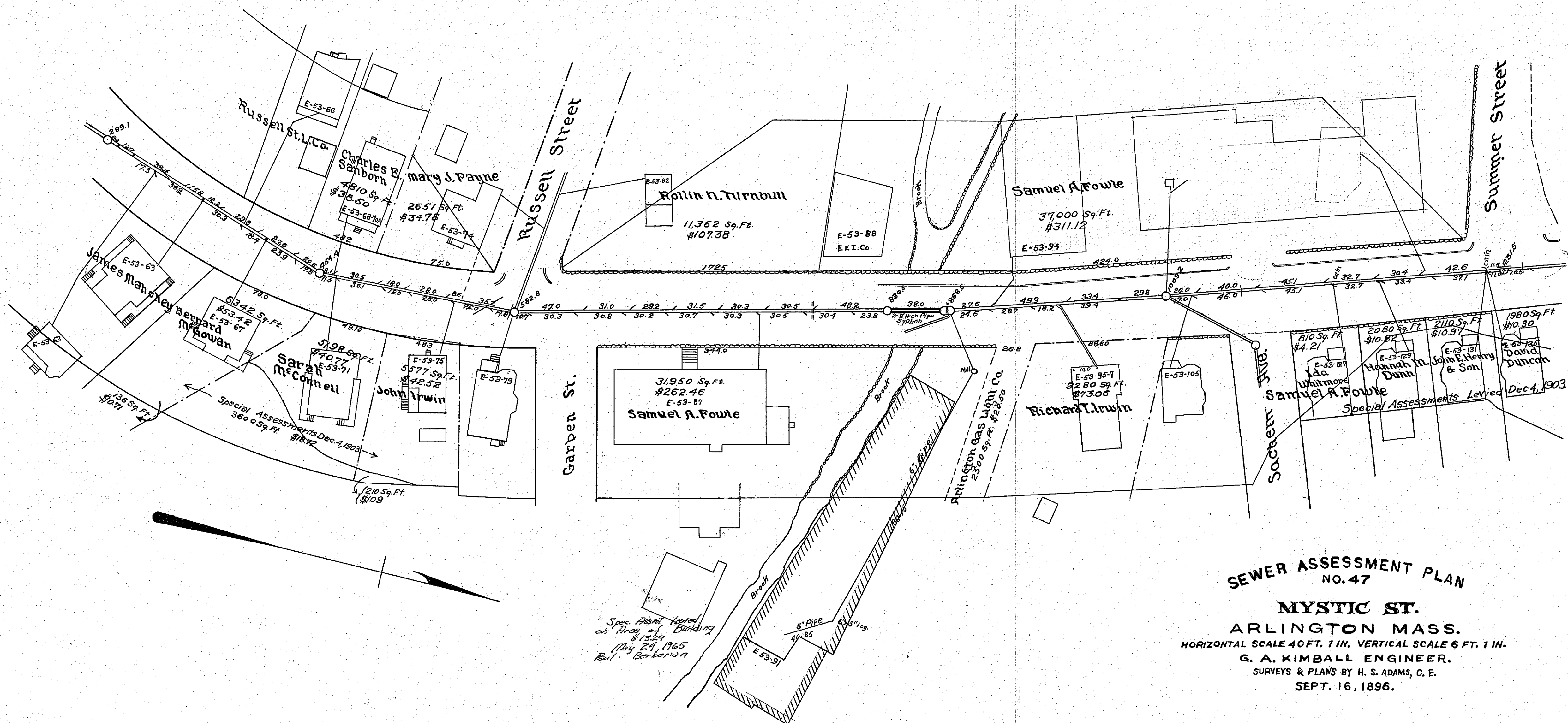
AC - Asbestos

<u>PIPE DATA</u>	<u>OUT TO</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>	<u>IN FROM</u>
Sub Area:	BA	BA			
Manhole #:	6	8			
Suffix:		A			
Diameter (in):	18	18			
Depth, Rim to Invert (ft):	8	8			
Type of Pipe:	VC	VC			

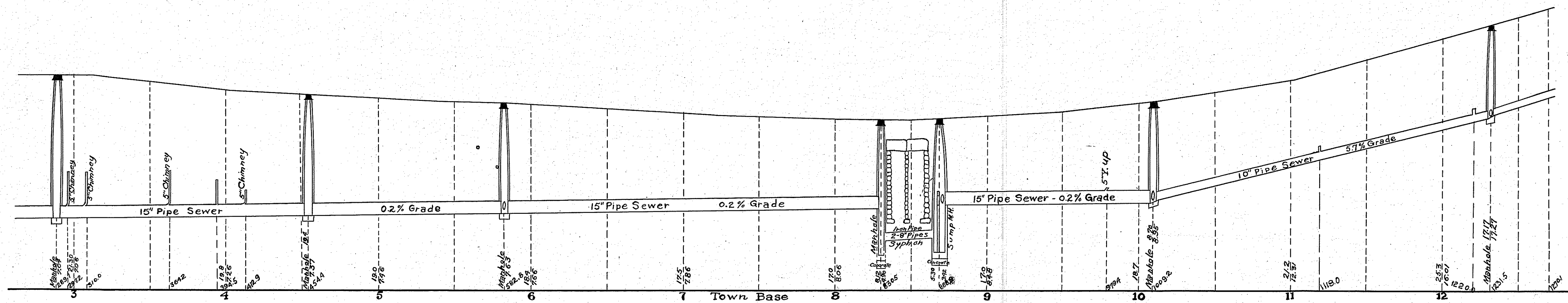


## APPENDIX B

### MYSTIC STREET SEWER RECORD DRAWING



SEWER ASSESSMENT PLAN  
NO. 47  
**MYSTIC ST.**  
**ARLINGTON MASS.**  
HORIZONTAL SCALE 40 FT. 1 IN. VERTICAL SCALE 6 FT. 1 IN.  
G. A. KIMBALL ENGINEER.  
SURVEYS & PLANS BY H. S. ADAMS, C. E.  
SEPT. 16, 1896.



**MYSTIC ST. 2382**  
**#65 TO SUMMER ST.**

## APPENDIX C

### MYSTIC STREET SIPHON – EXISTING MANHOLE PHOTOS



**EXISTING MANHOLE MA-120**  
**SHEET C-1 STATION 2+48**  
**AREA PHOTO**



**EXISTING MANHOLE MA-120**  
**SHEET C-1 STATION 2+48**  
**FRAME AND COVER PHOTO**





**EXISTING MANHOLE MA-120**  
**SHEET C-1 STATION 2+48**  
**INTERNAL PHOTO**



**EXISTING MANHOLE MA-121**  
**SHEET C-1 STATION 2+86**  
**AREA PHOTO**





**EXISTING MANHOLE MA-121**  
**SHEET C-1 STATION 2+86**  
**FRAME AND COVER PHOTO**



**EXISTING MANHOLE MA-121**  
**SHEET C-1 STATION 2+86**  
**INTERNAL PHOTO #1**





**EXISTING MANHOLE MA-121**  
**SHEET C-1 STATION 2+86**  
**INTERNAL PHOTO #2**



**EXISTING MANHOLE MA-121**  
**SHEET C-1 STATION 2+86**  
**INTERNAL PHOTO #3**





**EXISTING MANHOLE MA-121A**  
**SHEET C-3 STATION 0+42**  
**AREA PHOTO**



**EXISTING MANHOLE MA-121A**  
**SHEET C-3 STATION 0+42**  
**FRAME AND COVER PHOTO**





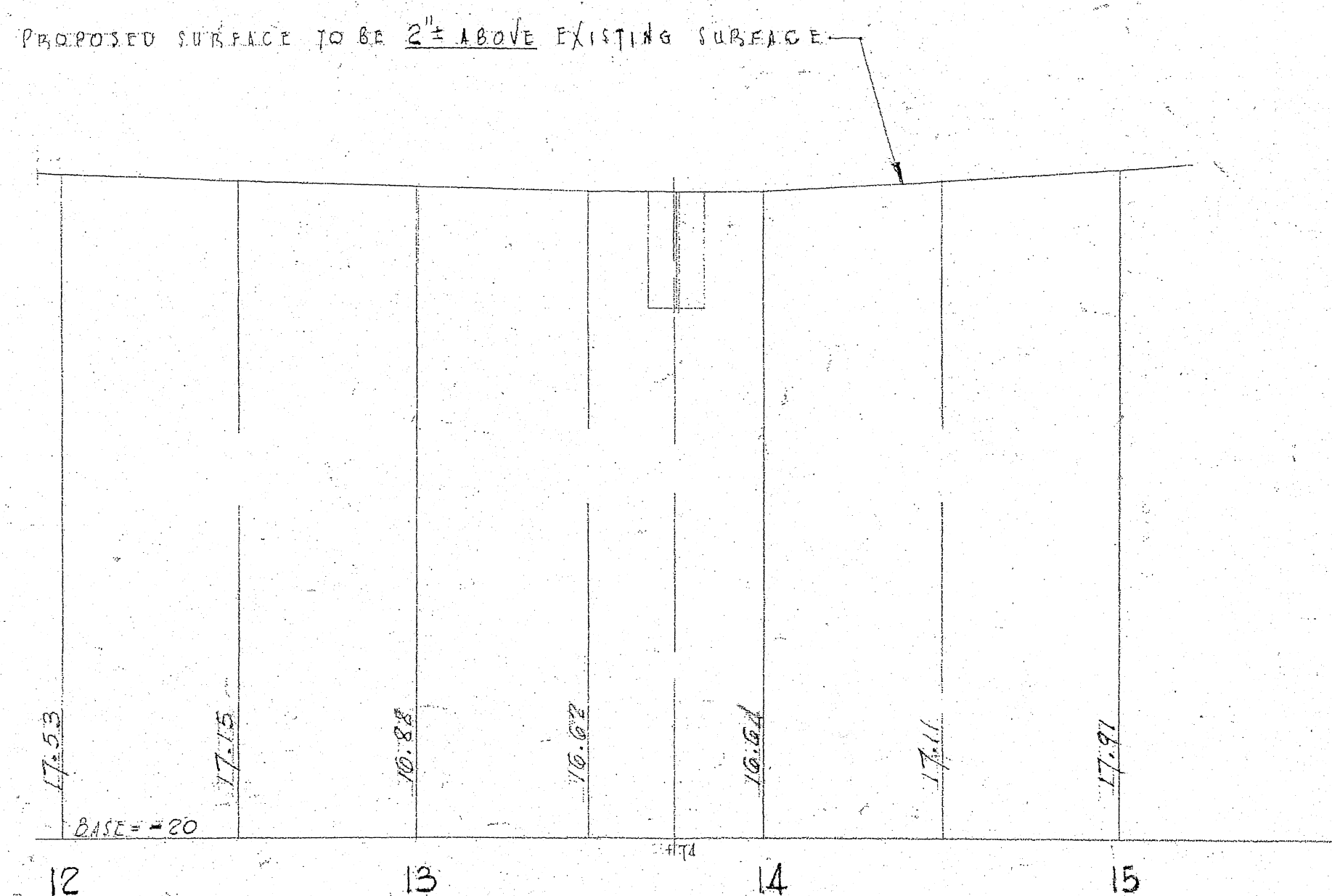
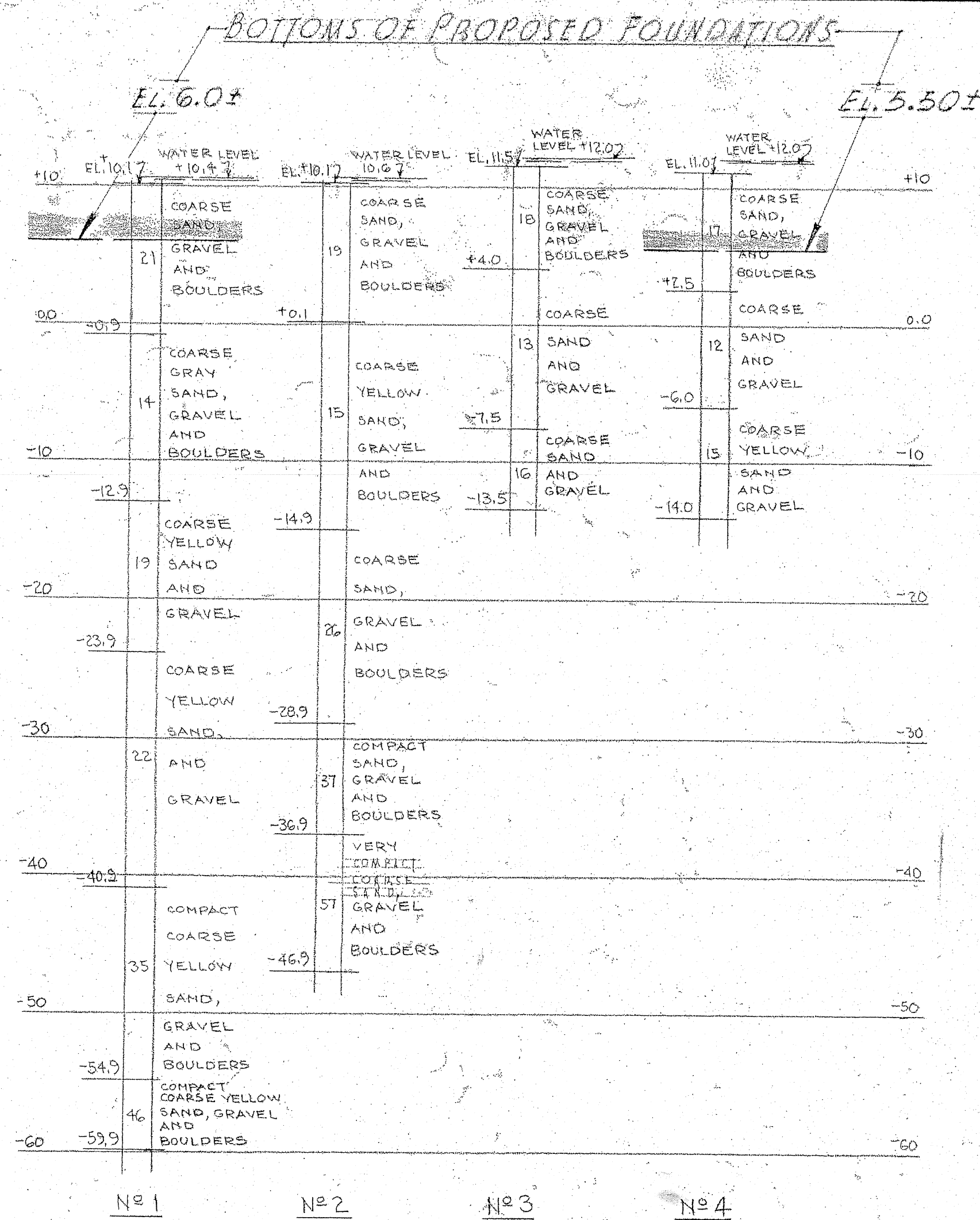
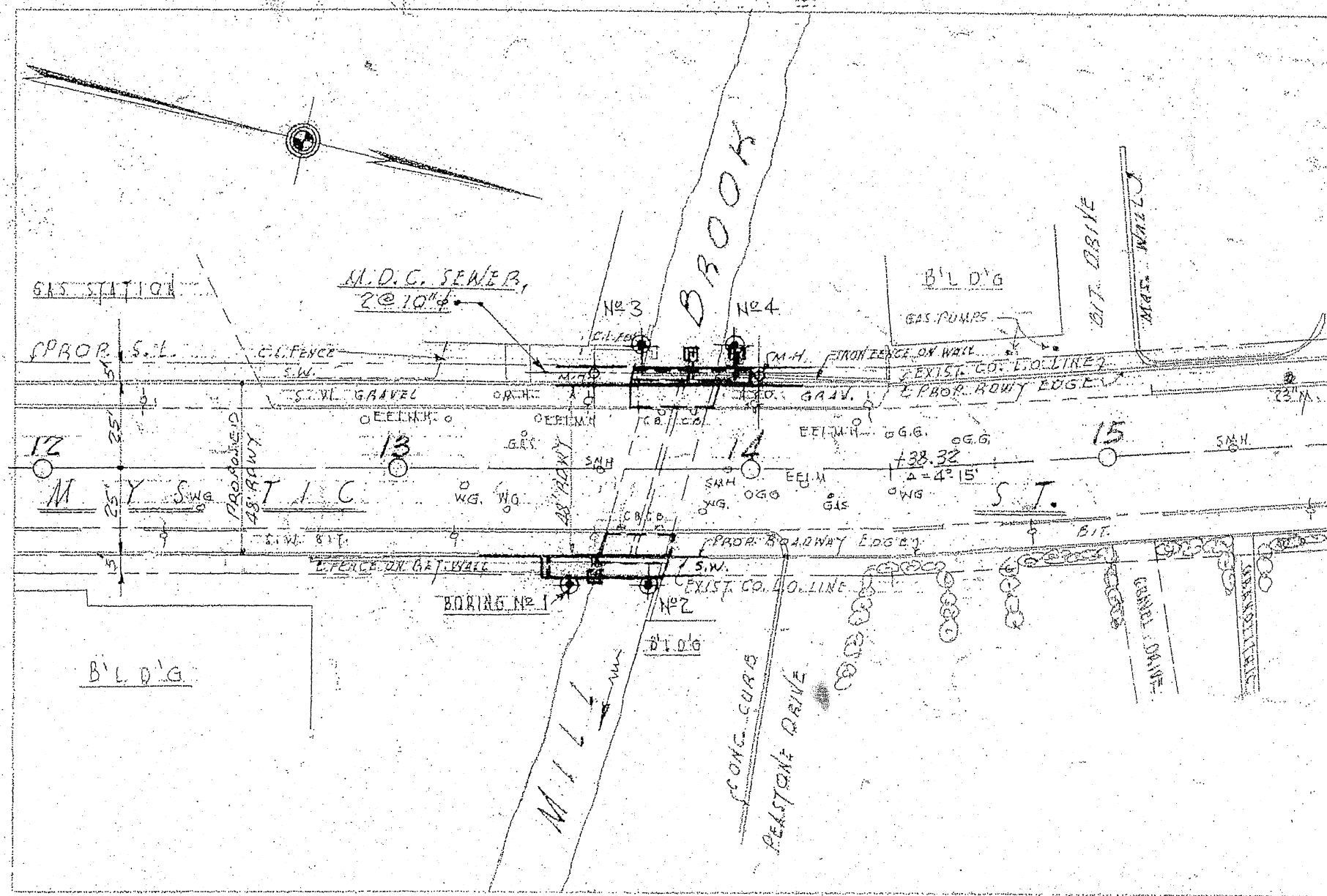
**EXISTING MANHOLE MA-121A**  
**SHEET C-3 STATION 0+42**  
**INTERNAL PHOTO**



## APPENDIX D

### MYSTIC STREET BORING LOGS





**GENERAL NOTES**

**FOUNDATIONS:**  
MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED IN CONSTRUCTION.

**REINFORCEMENT:**  
ALL REINFORCING STEEL BARS SHALL CONFORM TO A.S.T.M. SPECIFICATION A-305. UNLESS OTHERWISE SHOWN ON THE PLANS, REINFORCING BARS SHALL BE LAPPED 20 DIAMETERS TO MAKE A SPICE, EXCEPT THAT MAIN REINFORCING BARS NEAR THE TOP OF SLABS AND BEAMS HAVING MORE THAN 12 INCHES OF CONCRETE UNDER THE BARS SHALL BE LAPPED 35 DIAMETERS TO MAKE A SPICE.

**BORING NOTES:**  
LOCATIONS OF BORINGS SHOWN ON KEY PLAN THUS: • No. 3. BORINGS TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW NATURE OF MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION. FIGURES IN COLUMNS INDICATE BLOWS PER FOOT ON 1 1/4" PIPE PRODUCED BY 30 INCH FALL OF 140 POUND HAMMER. BORING SAMPLES MAY BE SEEN AT THE DEPARTMENT'S LABORATORY IN THE MAINTENANCE BUILDING ON ROUTE No. 9 IN WELLESLEY.

**DESIGN:**  
IN ACCORDANCE WITH THE CURRENT SPECIFICATIONS OF THE A.S.T.M. FOR M. 20-44 LOADING.

**DATE:**  
TO BE PLACED IN CENTRE OF OUTSIDE EDGES OF SIDEWALK BEAMS. FOR SITE AND CHARACTER OF NUMERALS, SEE ANOTHER SHEET.

**BENCH MARK:**  
HYDRAULIC (W) STATION 10+59, EL. 21.59.

**ESTIMATED QUANTITIES**  
NOT GUARANTEED

BRIDGE EXCAVATION	84 CY.
CLASS B ROCK EXCAVATION	5 CY.
MASONRY EXCAVATION	5 CY.
CLASS C CONC. MASONRY	45 CY.
STEEL BEAM FOR STRUCTURES	7,900 LBS.
CEMENT FOR POINTING	2.66 TS.
STENTIONS RAMP-ROOFING	30 CY.
METAL BRIDGE BAILING - TYPE H	60 LBS.
FRAMES & GRATES REMOVED & RESET	4 EA.
GRANITE CURB TYPE VAS. 110 65" H	105 LB.
ALTERATIONS TO PIPE RAIL FENCE	1 TS.

DESIGNED BY RIMSEY	MAY 24, 1958	ISSUED FOR CONSTRUCTION
DRAWN BY RIMSEY	THE COMMONWEALTH OF MASSACHUSETTS	
CHECKED BY ALBRECHT	PROPOSED BRIDGE	
APPROVED FOR DESIGN	ARLINGTON	
ARCHITECTURAL	MYSTIC STREET, STATION 13+73	
SPECS. H. H. HARRIS	OVER MILL BROOK	
OFFICE OF DEPARTMENT OF PUBLIC WORKS 100 NASSAU ST., BOSTON, MASS. MAY 1958	Scales as noted	
LETTERING H. H. HARRIS	OFFICE OF DEPARTMENT OF PUBLIC WORKS 100 NASSAU ST., BOSTON, MASS. MAY 1958	